Office of the Superintendent of Financial Institutions Canada
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ACTUARIAL REPORT

on the Pension Plan for the

CANADIAN FORCES

Regular Force
as at 31 March 2013

Canada

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28 October 2014

The Honourable Tony Clement, P.C., M.P.
President of 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 2013 of the Canadian Forces – Regular Force pension plan. This plan is defined by Parts I, III and IV of the *Canadian Forces Superannuation Act*, the *Pension Benefits Division Act* and the Canadian Forces-related benefits provided under the *Special Retirement Arrangements Act*.

Yours sincerely,

Jean-Claude Ménard

Jean-Claude Ménard, F.S.A., F.C.I.A.
Chief Actuary
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I. Executive Summary

This actuarial report on the pension plan for the Canadian Forces – Regular Force (CF pension plan) was made pursuant to the *Public Pensions Reporting Act* (PPRA).

This actuarial valuation is as at 31 March 2013 and is in respect of pension benefits and contributions defined by Parts I, III and IV of the *Canadian Forces Superannuation Act* (CFSA), the *Special Retirement Arrangements Act*, which covers the Retirement Compensation Arrangement (RCA), and the *Pension Benefits Division Act* (PBDA).

The previous actuarial report was made as at 31 March 2010. The date of the next periodic review is scheduled to occur no later than 31 March 2016.

A. Purpose of the Report

The purpose of this actuarial valuation is to determine the state of the Canadian Forces Superannuation Account, the Canadian Forces Pension Fund and the Retirement Compensation Arrangements Account, as well as to assist the President of the Treasury Board in making informed decisions regarding the financing of the government's pension benefit obligation.

B. Valuation Basis

Adopted increased member contribution rates for 2013, 2014 and 2015 are taken into account in this report. Further, in accordance with the *Jobs and Growth Act, 2012*, member contribution rates will rise gradually, in line with contribution rates for the pension plan for the Public Service of Canada, which are increasing such that the cost of that plan is shared equally between government and employees by 2017. There have been no other changes to the plan provisions since the previous valuation. This report is based on pension benefit provisions enacted by legislation, summarized in Appendices 1 and 2.

The financial data on which this valuation is based are composed of invested assets that the government has earmarked for the payment of benefits for service since 1 April 2000 (the Pension Fund); the Superannuation Account established to track the government's pension benefit obligations for service prior to 1 April 2000; and the RCA Account for benefits in excess of those that can be provided under the *Income Tax Act* limits for registered pension plans. These pension assets and accounts available for benefits are summarized in Appendix 3. The membership data provided by the Department of National Defence (DND) and the Department of Public Works and Government Services Canada (PWGSC) is summarized in Appendix 4.

The valuation was prepared using accepted actuarial practices, methods and assumptions, which are summarized in Appendices 5 to 8.

All actuarial assumptions used in this report are best-estimate assumptions. They are, individually and in aggregate, reasonable for the purposes of the valuation at the date of this report.

Actuarial assumptions used in the previous report were revised based on economic trends and demographic experience. A complete description of the assumptions is given in Appendices 6 and 7. Table 1 represents a summary of the ultimate economic assumptions used in this report and a comparison with those used in the previous report.

Table 1 Ultimate Best-Estimate Economic Assumptions

	31 March 2013	31 March 2010
Assumed level of inflation	2.0%	2.3%
Real increase in average pensionable earnings	1.0%	1.2%
Real rate of return on the Pension Fund	4.1%	4.2%
Real rate of return on the Superannuation Account	2.8%	2.8%

C. Main Findings

The proposed amounts to be credited to (or debited from) the Accounts and the Pension Fund are shown on a calendar year basis in this section, beginning with calendar year 2015, which is the first calendar year that follows the expected tabling of this report. Valuation results on a plan year[1] basis are shown in Section II.

1) Superannuation Account (Service prior to 1 April 2000)

As at 31 March 2013, the total of the amounts available for benefits payable under the Superannuation Account is $46,390 million and the actuarial liability for service prior to 1 April 2000[2] is $45,233 million. The excess of the total of the amounts available for benefits over the actuarial liabilities is $1,157 million. The total of the amounts available for benefits is 103% of the corresponding actuarial liability, which is less than the 110% threshold of the maximum permitted amount set out in legislation.

2) Pension Fund (Service since 1 April 2000)

a) Current Service Cost[3]

The estimated CFSA total current service cost, borne jointly by the contributors and the government, is $1,190 million for calendar year 2015. The estimated member contributions are $436 million and the estimated government contributions are $754 million for calendar year 2015. The Pension Fund administrative expenses are estimated at $10 million (included in the total current service cost) for calendar year 2015. The following table also shows the projected current service cost expressed as a percentage of the expected pensionable payroll[4] and the ratio of government current service cost to contributor current service cost for the three calendar years following the expected tabling of this report.

1 Any reference to a given *plan year* in this report refers to the 12-month period ending 31 March of the given year.
2 The actuarial liability for service prior to 1 April 2000 refers to the actuarial liability for service accrued prior to that date except for service elections since 1 April 2000 that are deemed to be service accrued since that date.
3 Also called normal cost.
4 Pensionable payroll means the aggregate of pensionable earnings of all contributors with less than 35 years of service.

Table 2 CFSA Current Service Cost on a Calendar Year Basis

	Current Service Cost As a percentage of pensionable payroll			Current Service Cost ($ millions)			Ratio of Government to Contributors
Calendar Year	Contributors	Government	Total	Contributors	Government	Total	Current Service Cost
2015	8.73	15.10	23.83	436.0	754.0	1,190.0	1.73
2016	9.35	14.42	23.77	476.0	734.0	1,210.0	1.54
2017	9.87	13.81	23.68	514.0	719.0	1,233.0	1.40

b) Financial position and amortization of actuarial surplus (deficit)

As at 31 March 2013, the actuarial value of the assets in respect of the Pension Fund is $14,914 million and the actuarial liability is $17,350 million, resulting in an actuarial deficit of $2,436 million.

In accordance with the CFSA, the actuarial deficit can be amortized over a period of up to 15 years, such that the amount that in the opinion of the President of the Treasury Board will, at the end of the fifteenth fiscal year following the tabling of that report or at the end of the shorter period that the President of the Treasury Board may determine, together with the amount that the President of the Treasury Board estimates will be to the credit of the Pension Fund at that time, meet the cost of the benefits payable in respect of pensionable service after 1 April 2000. Thus, the actuarial deficit of $1,715[1] million can be amortized with 15 equal annual special payments of $155 million beginning on 31 March 2015, which takes into account that a special payment of $249 million, determined by the President of the Treasury Board following the laying of the actuarial report as at 31 March 2010, will be made as at 31 March 2014. However, the final time, manner and amount of the special payments are to be determined by the President of the Treasury Board.

c) Non-permitted actuarial surplus

If there exists, in the opinion of the President of the Treasury Board, a non-permitted actuarial surplus[2] in the Pension Fund, no further government contributions are permitted. Future member contributions to the Fund may also be reduced in a manner determined by the Treasury Board or the non-permitted actuarial surplus may be paid out of the Fund and into the Consolidated Revenue Fund . The results of this valuation do not indicate the existence of a non-permitted actuarial surplus as at 31 March 2013.

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[1] The actuarial smoothing adjustment of $721 million is ignored when calculating the amortization payments. More information is provided on page 12.

[2] A non-permitted actuarial surplus exists when the amount by which the actuarial value of assets exceeds liabilities for service since 1 April 2000 is greater than the lesser of (a) and (b), where:
(a) is 20% of the amount of liabilities for service since 1 April 2000, and
(b) is the greater of (i) and (ii) where:
(i) is twice the estimated amount, for the calendar year following the date of that report, of the total of
(A) the current service cost contributions that would be required of contributors, and
(B) the current service cost contributions that would be required of the government; and
(ii) is 10% of the amount of liabilities for service since 1 April 2000.

3) RCA Account

As at 31 March 2013, the total of the amounts available for benefits payable under the RCA Account is $649 million and the actuarial liability is $561 million, resulting in an actuarial excess of $88 million.

The estimated RCA total current service cost, borne jointly by the contributors and the government, is $40.1 million for calendar year 2015 and is estimated to be $42.1 million and $44.3 million, respectively, for the following two calendar years. Table 3 also shows the projected current service cost expressed as a percentage of the expected pensionable payroll[1] and the ratio of government current service cost to contributor current service cost for the three calendar years following the expected tabling of this report.

Table 3 RCA Current Service Cost on a Calendar Year Basis

	Current Service Cost As a percentage of pensionable payroll			Current Service Cost ($ millions)			Ratio of Government to Contributors
Calendar Year	Contributors	Government	Total	Contributors	Government	Total	Current Service Cost
2015	0.07	0.74	0.81	3.3	36.8	40.1	11.2
2016	0.07	0.76	0.83	3.6	38.5	42.1	10.7
2017	0.08	0.77	0.85	4.0	40.3	44.3	10.1

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

II. Valuation Results

This report is based on pension benefit provisions enacted by legislation, summarized in Appendices 1 and 2, and the financial and membership data summarized in Appendices 3 and 4. The valuation was prepared using accepted actuarial practices, methods and assumptions summarized in Appendices 5 to 8. Emerging experience that differs from the corresponding assumptions will result in gains or losses to be revealed in subsequent reports.

Projections of the financial positions of the Superannuation Account and the Pension Fund are shown in Appendices 9 and 10, respectively.

A. CFSA - Financial Position

Beginning on 1 April 2000, member and government contributions to the CF pension plan are no longer credited to the Canadian Forces Superannuation Account. Rather, they are credited to the Canadian Forces Pension Fund, and the total amount of contributions net of benefits paid and administrative expenses is transferred to the Public Sector Pension Investment Board (PSPIB) and invested in the financial markets. The valuation results of this section show the financial position for both CFSA financing arrangements as at 31 March 2013. The results of the previous valuation are also shown for comparison purposes.

Table 4 State of the Superannuation Account
(Service Prior to 1 April 2000)
($ millions)

	31 March 2013	31 March 2010
Recorded Account balance	46,357	45,490
Present value of prior service contributions	33	47
Total	46,390	45,537
Actuarial Liability		
Active contributors	7,534	8,892
Retirement pensioners	34,362	31,248
Disability pensioners	197	341
Surviving dependents	2,917	2,595
Administrative expenses	149	134
Pension Modernization cost	74	-
Total Actuarial Liability	45,233	43,210
Actuarial Excess/(Shortfall)	1,157	2,327

Table 5 Balance Sheet - Pension Fund
(Service Since 1 April 2000)
($ millions)

	31 March 2013	31 March 2010
Assets		
Market value of assets	15,148	9,145
Actuarial smoothing adjustment	(721)	(256)
Present value of prior service contributions	198	170
Amount receivable from Part I.1 - Roll-over members	105	-
Remaining contributions for pre-2007 Reserve Force service	184	-
Total assets	14,914	9,059
Actuarial Liability		
Active contributors	11,782	8,184
Contributors' pre-2007 Reserve Force service	237	-
Retirement pensioners	5,229	2,927
Disability pensioners	6	5
Surviving dependents	51	28
Pension Modernization cost	45	-
Total Actuarial Liability	17,350	11,144
Actuarial Surplus/(Deficit)	(2,436)	(2,085)

In accordance with the CFSA, the actuarial deficit can be amortized over a period of up to 15 years, such that the amount that, in the opinion of the President of the Treasury Board will, at the end of the fifteenth fiscal year following the tabling of that report or at the end of the shorter period that the President of the Treasury Board may determine, together with the amount that the President of the Treasury Board estimates will be to the credit of the Pension Fund at that time, meet the cost of the benefits payable in respect of pensionable service after 1 April 2000. Therefore, the deficit of $1,715 million could be amortized in 15 equal annual payments of $155 million beginning on 31 March 2015. If the deficit is amortized over the expected average remaining service lifetime (EARSL) of current contributors, 13 equal annual payments of $170 million could be paid beginning on 31 March 2015. The annual special payments were calculated taking into account that a special payment of $249 million, determined by the President of the Treasury Board following the laying of the 2010 actuarial valuation, will be made as at 31 March 2014.

The actuarial smoothing adjustment of $721 million will disappear over the next five years as the unrecognized investment gains will be gradually recognized.

B. CFSA - Reconciliation of the Changes in Financial Position

Table 6 shows the reconciliation of the changes in financial position of the Superannuation Account and the Pension Fund. Explanations of the elements largely responsible for the changes follow the table.

Table 6 Reconciliation of CFSA Financial Position
($ millions)

	Superannuation Account Actuarial Excess/(Shortfall)	Pension Fund Actuarial Surplus/(Deficit)
As at 31 March 2010	2,327	(2,085)
Recognized investment gains as at 31 March 2010	-	256
Change in methodology	196	242
Retroactive changes to the population data	(329)	(467)
Expected interest on initial financial position	426	(399)
Amounts credited on basis of actuarial valuation	-	498
Net experience gains and losses	(134)	969
Revision of actuarial assumptions	(1,230)	(802)
Change in the present value of administrative expenses	(31)	-
Change in the present value of prior service contributions	6	66
Amount receivable from Part I.1 - Roll-over members	-	105
Pre-2007 Reserve Force service recognition	-	(53)
Pension Modernization cost	(74)	(45)
Unrecognized investment gains as at 31 March 2013	-	(721)
As at 31 March 2013	1,157	(2,436)

1) Recognized Investment Gains as at 31 March 2010

An actuarial asset valuation method that minimizes the impact of short-term fluctuations in the market value of assets was used in the previous valuation report, causing the actuarial value of the Pension Fund assets to be $256 million less than their market value.

2) Change in Methodology

The methodology used in previous reports to identify members eligible for an immediate annuity after 20 years of qualifying service under the new provisions implemented in 2007 was changed. Since 2011, the Department of National Defence (DND) has provided us with a list of members with “grandfathered” entitlement to the old provisions. Based on this list, the number of grandfathered members was reduced significantly from our previous valuation report. The net impact of this change in methodology resulted in a decrease of $196 million and $242 million, respectively, in the Superannuation Account and Pension Fund actuarial liabilities.

3) Retroactive Changes to the Population Data

The net impact of the retroactive changes to the population data received from both DND and Public Works and Government Services Canada (PWGSC) has resulted in an increase of $329 million in the Superannuation Account actuarial liabilities and an increase of $467 million in the Pension Fund actuarial liabilities.

4) Expected Interest on Initial Financial Position

After factoring in the change in methodology and the retroactive changes to the population data, the expected interest to 31 March 2013 on the Superannuation

Account actuarial excess of $2,194 million as at 31 March 2010 amounted to $426 million. After recognizing the change in methodology, the retroactive changes to the population data and the recognized investment gains items, the expected interest to 31 March 2013 on the resulting Pension Fund actuarial deficit of $2,054 million as at 31 March 2010 amounted to $399 million. These amounts of interest were based on the Superannuation Account and Pension Fund yields projected in the previous report for the three-year intervaluation period.

5) Amounts Credited on Basis of Actuarial Valuation

A deficit of $2,085 million was reported in the Pension Fund as at 31 March 2010, and the government took the position to amortize this deficit over the 13 years expected average remaining service lifetime of participating members of the Regular Force on 31 March 2010. Consequently, the Pension Fund assets increased by $498 million over the intervaluation period.

6) Experience Gains and Losses

Since the previous valuation, experience gains and losses have decreased the Superannuation Account actuarial excess by $134 million. The Pension Fund actuarial deficit, reported in item II.B.4) above, has decreased by $969 million due to the experience gains and losses over the three-year intervaluation period. The experience gain and loss items having the most significant effect are described in Table 7.

Table 7 Experience Gains and Losses
($ millions)

	Superannuation Account	Pension Fund
Demographic experience (i)		
Terminations with a return of contributions or a transfer value	(177)	(185)
Retirements	155	113
Disabilities 3B with an annuity	123	116
Non-disabled pensioner deaths	(107)	(3)
Terminations with a deferred annuity	(73)	(69)
Widow(er) deaths	(35)	-
Rehired pensioner members	2	(11)
Contributor deaths with survivors	(2)	(1)
Total	(113)	(39)
Investment earnings (ii)	(64)	1,077
Economic salary increases (iii)	80	128
Pension indexation (iii)	(237)	(22)
Expected/actual disbursements (iv)	26	(80)
Promotional and seniority increases (v)	(38)	(32)
Cost/contributions difference (vi)	59	26
Pension benefit division payments (vii)	(28)	(30)
Change in service accrual (viii)	1	(14)
Administrative expenses	(13)	(6)
YMPE increases	(5)	(5)
Miscellaneous	198	(34)
Net experience gains (losses)	(134)	969

(i) The net impact of the demographic experience increased the Superannuation Account actuarial liability by $113 million and increased the Pension Fund actuarial liability by $39 million. The demographic assumptions having a large impact are as follows:

- More than expected terminations with a return of contributions or the commuted value of pension resulted in an increase of $177 million in the Superannuation Account actuarial liability and a corresponding increase of $185 million in the Pension Fund actuarial liability.
- During the three-year intervaluation period, the number of retirements was less than expected overall. The combined financial impact of retirements is a decrease of $155 million in the actuarial liability of the Superannuation Account and a decrease of $113 million in the actuarial liability of the Pension Fund.
- Fewer than expected retirements due to 3B disability resulted in a decrease of $123 million in the actuarial liability of the Superannuation Account and a decrease of $116 million in the actuarial liability of the Pension Fund.
- Fewer than anticipated deaths amongst healthy pensioners resulted in an increase of $107 million in the Superannuation Account actuarial liability and $3 million in the Pension Fund actuarial liability.
- A lower than anticipated proportion of terminating members opting for a deferred annuity resulted in an increase of $73 million in the Superannuation Account actuarial liability and an increase of $69 million in the Pension Fund actuarial liability.
- Fewer than expected deaths amongst surviving spouses resulted in an increase of $35 million in the Superannuation Account actuarial liability

(ii) The rates of interest credited to the Superannuation Account were marginally less than the corresponding projected Account yields in the previous valuation. Consequently, the experience loss was $64 million. The investment return on the Pension Fund exceeded expectation in plan years 2011 and 2013, but was less than expected in plan year 2012. This resulted in an investment gain of $1,077 million over the three-year intervaluation period.

(iii) Economic salary increases during the intervaluation period were smaller than expected. This resulted in a decrease of $80 million in the Superannuation Account actuarial liability and a decrease of $128 million in the Pension Fund actuarial liability.

(iv) Higher than expected pension indexation in 2011 resulted in a loss of $237 million with respect to the Superannuation Account and a loss of $22 million with respect to the Pension Fund.

(v) $26 million less than expected was paid from the Superannuation Account in annuity payments, while $80 million more than expected was paid from the Pension Fund.

(vi) Promotional and seniority salary increases were higher than expected at many ages resulting in an increase of $38 million in the Superannuation Account actuarial liability and an increase of $32 million in the Pension Fund actuarial liability.

(vii) Higher than expected member and government contributions during the intervaluation period resulted in gains of $59 million with respect to the Superannuation Account and $26 million with respect to the Pension Fund.

(viii) The net impact of the divisions of pension due to marriage breakdown accounted for a decrease of $28 million in the Superannuation Account actuarial excess and an increase of $30 million in the Pension Fund actuarial deficit.

7) Revision of Actuarial Assumptions

Actuarial assumptions were revised based on economic trends and demographic experience as described in Appendix 7. This revision has increased the Superannuation Account actuarial liabilities by $1,230 million and the Pension Fund actuarial liabilities by $802 million. The impacts of these revisions are described in the following table.

Table 8 Revision of Actuarial Assumptions
($ millions)

Assumption	Superannuation Account	Pension Fund
Economic assumptions		
Pension Indexation	1,627	610
Increase in average pensionable earnings	135	430
Rates of return	(2,810)	(1,899)
Total	(1,048)	(859)
Survivor mortality rates	(57)	(6)
Longevity improvement factors	(213)	(33)
Pensioner mortality rates	(72)	(25)
Disabled retirements 3B	3	41
Proportion married at death	65	16
Pensionable retirements	124	247
Annuity reduction factors	(5)	(10)
Seniority and promotional salary increases	(20)	(43)
Proportion electing a deferred annuity	2	(25)
Withdrawals	(9)	(106)
Contributor mortality rates	-	-
Net impact of revision	(1,230)	(802)

The net impact of the revision of the assumptions on the Superannuation Account is largely attributable to the change in economic assumptions and the new longevity improvement factors. With respect to the Pension Fund, the net impact of the revision is largely attributable to the change in economic assumptions and the new pensionable retirement rate assumptions.

The following revisions were made to the economic assumptions used in the previous report:

- ultimate level of inflation decreased from 2.3% to 2.0%;
- ultimate real increase in average earnings decreased from 1.2% to 1.0%; and
- ultimate real rate of return on the Pension Fund decreased from 4.2% to 4.1%.

Details of the changes in economic assumptions, including the assumed yield on the Superannuation Account, are described in Appendix 6.

8) Change in the Present Value of Administrative Expenses

The previous report annual administrative expense assumption of 0.4% of total pensionable payroll is increased to 0.5% in this report. This increase is based on the projection of administrative expenses provided by DND, which covers the next three years. DND expects a marginal increase in cost once the administration of the pension plan falls under the responsibility of PWGSC as per the Pension Modernization Project.

For plan year 2014, 64% of total administrative expenses are being charged to the Superannuation Account; it is assumed that the proportion charged to the Superannuation Account will continue to reduce at the rate of 3% per year as per the previous report. The additional 0.1% of annual administrative expenses resulted in a decrease of $31 million of the Superannuation Account actuarial excess.

9) Change in the Present Value of Prior Service Contributions

The expected total government cost is shown in Table 19 on page 24. The government is expected to make additional contributions in excess of the current service cost for members' expected prior service elections. The change in the present value of prior service contributions corresponds to members' elections since the last report where the members opted to pay for these elections by instalments. Members' prior service elections paid through instalments have the effect of increasing the Superannuation Account and the Pension Fund assets by $6 and $66 million respectively.

10) Amount receivable from PartI.1 - Roll-over members

Upon the completion of a minimum of 55 months of Canadian Forces service within a consecutive 60 months period, a member of the Reserve Force is automatically rolled-over to the Regular Force pension plan and his/her participation to the Reserve Force pension plan is terminated. All accumulated services are then transferred to the Regular Force pension plan where the liability associated with this service will now be recognized. The Transfer Value of the accrued benefit earned under the Reserve Force pension plan is transferred from the assets of the Reserve Force pension plan to the assets of the Regular Force pension plan.

In normal circumstances, the time elapsed between the roll-over date and the date of the transfer of assets between the plans is minimal. However, as of the valuation date a total of 2,554 members have been identified as members who have rolled-over to the Regular Force pension plan and the assets associated with these members have not been transferred. Since the liability associated with these members have been transferred to the Regular Force pension plan, the associated Transfer Value amount to be transferred from the assets of the Reserve Force pension plan has been estimated at $105 million. Accordingly, the Pension Fund deficit is decreased by $105 million and this amount has been recorded as assets to be received from Part I.1 of the CFSA, the Reserve Force pension plan.

11) Pre-2007 Reserve Force Service Recognition

With the coming into force of the new Reserve Force pension plan in 2007, members of the Regular Force were provided with the option to buy back pre-2007 Reserve Force service to count toward their pension entitlement under the CF pension plan. The methodology used in the past to account for elective service was to recognize the service once the member's election had been processed by DND. This type of election was allowed until the end of February 2011. As at 1 March 2011, there was a backlog of approximately 11,000 Reserve Force service elections. As at 31 March 2013, approximately 4,831 member elections remained in the backlog.

For the current valuation, DND has provided a list of the remaining members with pre-2007 Reserve Force service elections that have not yet been processed. A total of 2,114 Part I such elections have been recognized in this valuation, so that the additional prior service has been counted toward the determination of the liability and the normal cost of the CF pension plan. The cost of these elections to both the members and the government has also been recognized; a total of $184 million has been added to the Pension Fund assets. The recognition of this past Reserve Force service has increased the Pension Fund actuarial liability by a total of $237 million which ultimately resulted in an increase of $53 million in the Pension Fund deficit.

12) Pension Modernization Cost

The PWGSC Pension Modernization Project is now focused on bringing the administration of the pension plan for the Canadian Forces – Regular Force under the responsibility of PWGSC. This project is now in effect and DND expects it to be completed by plan year 2017. The cost associated with this project will be debited directly from the Superannuation Account and the Pension Fund. The net impact of the project is a reduction of $74 million to the Superannuation Account excess and an increase of $45 million to the Pension Fund deficit.

13) Unrecognized Investment Gains

The actuarial asset valuation method used in this valuation is the same as that described in the 2010 valuation report. The purpose of the actuarial asset valuation method is to minimize the impact of short-term fluctuations in the market value of assets (see Appendix 6). For this valuation, the method resulted in an actuarial value of Pension Fund assets that is $721 million less than the market value, due to unrecognized investment gains.

C. CFSA - Cost Certificate

1) Current Service Cost

The details of the current service cost for plan year 2014 and reconciliation with the 2011 current service cost are shown below.

Table 9 Current Service Cost for Plan Year 2014
($ millions)

Members required contributions	369
Government current service cost	797
Total current service cost	1,166
Expected pensionable payroll	4,846
Total current service cost as % of expected pensionable payroll	24.06%

Table 10 Reconciliation of CFSA Current Service Cost
(Percentage of pensionable payroll)

For plan year 2011	23.15
Expected current service cost change	(0.11)
Change in demographics	(0.07)
Changes in assumptions	
Indexation, Earnings , Short Term Economic	1.01
Pensionable retirements	(0.44)
Withdrawals	0.27
Seniority and promotional salary increases	0.13
Disabled retirements 3B	(0.09)
Proportion electing a deferred annuity	0.08
Mortality improvement factors	0.05
Administrative expenses	0.04
Pensioners mortality rates	0.03
Proportion married at death	(0.03)
Annuity reduction factors	0.02
Survivors mortality rates	0.01
Assumptions related to children and students	0.01
For plan year 2014	24.06

2) Projection of Current Service Costs

The current service cost is borne jointly by the plan members and the government. The member contribution rates have been changed since the last valuation, they are shown in Table 11. The contribution rates shown after calendar year 2015 are not final and subject to change.

Table 11 Member Contribution Rates

Calendar Year	Below YMPE	Above YMPE
2013	6.85%	9.20%
2014	7.50%	9.80%
2015	8.15%	10.40%
2016	8.80%	11.00%
2017	9.47%	11.58%
2018	9.52%	11.65%

Current service costs on a plan year basis, expressed in dollar amount as well as in percentage of the projected pensionable payroll, are shown in Table 12. The member contributions and the government current service costs are also shown on a calendar year basis in the Executive Summary.

Table 12 Projection of Current Service Cost

	$ Millions			Percentage of Pensionable Payroll			Portion Borne by the Government
Plan Year	Members	Government	Total	Members	Government	Total	
2014	369	797	1,166	7.61	16.45	24.06	68%
2015	407	770	1,177	8.25	15.61	23.86	65%
2016	445	749	1,194	8.87	14.93	23.80	63%
2017	486	729	1,215	9.50	14.25	23.75	60%
2018	523	716	1,239	9.99	13.67	23.66	58%
2023	603	820	1,423	10.00	13.61	23.61	58%
2028	696	960	1,656	9.96	13.74	23.70	58%

The decrease in the portion of the current service cost borne by the government from plan year 2014 to plan year 2018 mainly reflects increased member contribution rates.

3) Pension Fund Administrative Expenses

Based upon the assumptions described in Appendix 7 B. 3, the Pension Fund administrative expenses are included in the total current service costs. As for the previous report, the expected administration expenses exclude the PSPIB operating expenses, as these are recognized implicitly through a decrease in the real rate of return. The total administrative expenses are estimated to be as follows:

Table 13 Pension Fund Administrative Expenses

Plan Year	($ millions)
2014	8.7
2015	9.6
2016	10.5
2017	11.5

The Superannuation Account administrative expenses have been capitalized and are shown as a liability in the balance sheet.

4) Contributions for Prior Service Elections

Based on the valuation data and the assumptions described in sections B and C of Appendix 6, member and government contributions for prior service elections were estimated as follows:

Table 14 Estimated Contributions for Prior Service
($ millions)

	Regular Force Service			
	Account		Fund	
Plan Year	Members	Government	Members	Government
2014	1.5	1.5	8.0	17.1
2015	1.4	1.4	8.3	15.5
2016	1.4	1.4	8.5	14.2
2017	1.3	1.3	8.8	13.0
2018	1.3	1.3	9.1	12.3

D. Sensitivity of Valuation Results to Variations in Longevity Improvement Factors

This valuation assumes that the current mortality rates applicable to members of the Canadian Forces – Regular Force will improve over time. This assumption is based on the longevity improvement assumption[1] contained in the 26th Canada Pension Plan actuarial report. Table 15 measures the effect on the plan year 2014 current service cost and the liabilities for service prior to 1 April 2000 and for service since that date, under various longevity improvement assumptions. The current longevity improvement assumption is described in Table 39 of Appendix 7.

Table 15 Sensitivity of Valuation Results to Variation in Longevity Improvement Factors

	Current Service Cost as a percentage of pensionable payroll		Actuarial Liability ($ millions)				Age 65 Life Expectancy in 2013 (Age nearest in years)		
			Service prior to April 2000		Service since April 2000		Male Officer	Male Other Rank	Female
Longevity improvement factors	2014	Effect		Effect		Effect			
Current basis	24.06	None	45,233	None	17,350	None	22.6	20.2	23.8
- if 0%	23.20	(0.86)	43,483	(1,750)	16,805	(545)	21.1	18.6	22.6
- if ultimate 50% higher	24.33	0.27	45,642	409	17,511	161	23.0	20.5	24.2
- if ultimate 50% lower	23.87	(0.19)	45,028	(205)	17,244	(106)	22.5	20.1	23.7
- if kept at 2015 level	24.85	0.79	46,375	1,142	17,817	467	23.7	21.2	24.5

[1] In this report 'longevity improvement assumption' is equivalent to the 'mortality improvement assumption' discussed in the 26th Actuarial Report on the Canada Pension Plan

E. Sensitivity to Variations in Key Economic Assumptions

The information required by statute, which is presented in the main report, has been derived using best-estimate assumptions regarding future demographic and economic trends. The key best-estimate assumptions, i.e. those for which changes within a reasonable range have the most significant impact on the long-term financial results, are described in Appendices 6 and 7. Both the length of the projection period and the number of assumptions required ensure that actual future experience will almost certainly not develop precisely in accordance with the best-estimate assumptions. Individual sensitivity tests have been performed, projecting the pension plan's financial status using alternative assumptions.

The following tables measure the effect on the plan year 2014 current service cost, the liabilities for service prior to 1 April 2000 and for service since that date, when key economic assumptions are varied by one percentage point per annum.

Table 16 Sensitivity of Valuation Results to Variations in Key Economic Assumptions

	Current Service Cost as a percentage of pensionable payroll		Actuarial Liability ($ millions) Service prior to April 2000		Actuarial Liability ($ millions) Service since April 2000	
Assumption(s) Varied	2014	Effect		Effect		Effect
None (i.e. current basis)	24.06	None	45,233	None	17,350	None
Investment yield						
- if 1% higher	18.88	(5.18)	39,789	(5,444)	14,304	(3,046)
- if 1% lower	31.32	7.26	52,076	6,843	21,452	4,102
Inflation						
- if 1% higher	27.93	3.87	51,061	5,828	19,922	2,572
- if 1% lower	21.04	(3.02)	40,475	(4,758)	15,313	(2,037)
Salary, YMPE and MPE						
- if 1% higher	26.42	2.36	45,472	239	18,256	906
- if 1% lower	22.03	(2.03)	45,009	(224)	16,553	(797)
All economic assumptions						
- if 1% higher	23.58	(0.49)	44,648	(585)	16,979	(371)
- if 1% lower	24.57	0.51	45,840	607	17,743	393

The differences between the results above and those shown in the valuation 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 linear.

F. RCA - Financial Position

This section shows the financial position of the RCA Account as at 31 March 2013. The results of the previous valuation are also shown for comparison.

Table 17 State of the RCA
($ millions)

	31 March 2013	31 March 2010
Recorded Account balance	330	256
Refundable tax	319	238
Total	649	494
Actuarial Liability		
Pensionable excess earnings		
• Active contributors	361	271
• Pensioners	159	73
Survivor Allowance		
• Active contributors	6	6
• Pensioners	35	30
Total Actuarial Liability	561	380
Actuarial Excess/(Shortfall)	88	114

The sum of the recorded balance of the RCA Account and the refundable tax as at 31 March 2013 is $649 million, which exceeds the actuarial liability of $561 million by 15.7%. As at 31 March 2010, the sum of the recorded balance of the RCA Account and the refundable tax exceeded the actuarial liability by 30.0%.

G. RCA - Current Service Cost

The projected current service cost, borne jointly by the members and the government, of 0.84% for plan year 2014 calculated in the previous valuation has decreased by 0.08% to 0.76% of pensionable payroll in this valuation.

The RCA current service cost for plan year 2014 is estimated to increase to 0.78% and 0.81% of pensionable payroll for plan years 2015 and 2016 respectively.

The following table shows the estimated RCA current service cost for the next three plan years.

Table 18 RCA - Current Service Costs
($ millions)

	Plan Year		
	2014	2015	2016
Total current service cost			
Pensionable excess earnings	35.7	37.5	39.4
Survivor Allowance	1.0	1.1	1.1
Total	36.7	38.6	40.5
Member contributions	2.7	3.0	3.4
Government current service cost	34.0	35.6	37.1
Current service cost as % of total pensionable payroll	0.76%	0.78%	0.81%

H. Summary of Estimated Government Costs

The following table summarizes the estimated total government costs on a plan year basis.

Table 19 Estimated Government Cost
($ millions)

Plan Year	Current Service Cost		Total Prior Service Contributions	Total Government Cost
	CFSA	RCA		
2014	797	34	19	850
2015	770	36	17	822
2016	749	37	16	802

III. Actuarial Opinion

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

- the valuation input data on which the valuation is based are sufficient and reliable for the purposes of the valuation;
- the assumptions that have been used are, individually and in aggregate, appropriate for the purposes of the valuation;
- the methodology employed is appropriate for the purposes of the valuation; and
- this report has been prepared, and our opinions given, in accordance with accepted actuarial practice.

In particular, this report was prepared in accordance with the Standards of Practice (General Standards and Practice – Practice-Specific Standards for Pension Plans) published by the Canadian Institute of Actuaries.

To the best of our knowledge, after discussion with the Department of National Defence, there were no subsequent events between the valuation date and the date of this report that would have a material impact on the results of this valuation.

The payment of accrued pension benefits being the responsibility of the government, the likelihood of the plan being wound-up and its obligation not being fulfilled is practically nonexistent. Further, the legislation does not define the benefits payable upon wind-up. Therefore, a solvency valuation has not been performed.

Daniel Hébert, F.S.A., F.C.I.A. Senior Actuary	Jean-Claude Ménard, F.S.A., F.C.I.A Chief Actuary

Ottawa, Canada
28 October 2014

Appendix 1 - Summary of Pension Benefit Provisions

Pensions for members of the Canadian Forces (the Regular Force) were first provided under the Militia Pension Act of 1901, when in 1950 it became the *Defence Services Pension Act* until the *Defence Services Pension Continuation Act* and the *Canadian Forces Superannuation Act* (CFSA) were enacted in 1959. Benefits are also provided to members of the Regular Force under the *Special Retirement Arrangements Act*. Benefits may be modified in accordance with the *Pension Benefits Division Act* if there is a breakdown of a spousal union.

Changes since the last valuation

The previous valuation report was based on the pension benefit provisions as they stood as at 31 March 2010. Since then, all changes made to the CFSA are considered cosmetic and have no financial impact on the funding of the CF pension plan.

Methodology changes

With the implementation of the new provisions in 2007, the service threshold for an immediate annuity was increased from 20 to 25 years. Certain members retained entitlement to an immediate annuity under the old terms of service. For previous valuations, those members were determined based on the service data provided. Beginning in 2011, the Department of National Defence has provided us with a list of members with grandfathered entitlement to the old provisions. Based on this list, the number of grandfathered members was reduced significantly from our previous valuation report.

The methodology used in the past to account for elective service was to recognize that service only after the member's election had been processed by DND. With the coming into force of the new Reserve Force pension plan in 2007, members of the Regular Force were provided with the option to buy back pre-2007 Reserve Force service to count toward their pension entitlement under the CF pension plan; this type of election was allowed until the end of February 2011. As at 31 March 2013, there remains a backlog of such elections not yet processed. DND has provided a list of 2,114 pre-2007 Reserve Force service elections that are not yet processed as at 31 March 2013, so that the additional prior service has been counted toward the determination of the liability and the normal cost of the CF pension plan in this valuation.

Summary of Pension Benefit Provisions

Summarized in this appendix are the pension benefits provided under the CFSA registered provisions, which are in compliance with the *Income Tax Act*. The portion of the benefits in excess of the *Income Tax Act* limits for registered pension plans is provided under the retirement compensation arrangements described in Appendix 2.

The legislation shall prevail if there is a discrepancy between it and this summary.

A. Membership

Membership in the plan is compulsory for all members of the Canadian Forces.

As of 1 March 2007, a member of the Reserve Force is deemed to be a member of the Regular Force and will become a member of the plan,

- on 1 March 2007 if, on that date,
  - the member's total number of days of paid Canadian Forces service during any period of 60 months beginning on or after 1 April 1999 was no less than 1,674,
  - the member already was or became a member of the Canadian Forces during the first month of the period and remained a member of the Canadian Forces throughout the period without any interruption of more than 60 days,
  - the member is not a person required to contribute to the Public Service Pension Fund or the Royal Canadian Mounted Police Pension Fund, and
  - the member does not have any pensionable service to their credit under Part I of the CFSA;
- in any other case, on the first day of the month following a period of 60 months ending after 1 March 2007 if
  - the member's total number of days of paid Canadian Forces service during the period was no less than 1,674,
  - the member already was or became a member of the Canadian Forces during the first month of the period and remained a member of the Canadian Forces throughout the period without any interruption of more than 60 days, and
  - the member does not have any pensionable service to their credit under Part I of the CFSA.

The general rule is that, once a Reserve Force member is deemed a Regular Force member for the purposes of Part I of the CFSA and does not fail to receive pensionable earnings in any 12 consecutive months, the member remains a contributor under Part I of the CFSA as long as they remain a member of the Reserve Force. There are exceptions to the general rule previously described but for the purpose of this report, these were considered immaterial.

B. Contributions

1. Members

During the first 35 years of pensionable service, members contribute according to the rates shown in the following table. The contribution rates shown after calendar year 2015 are not final and subject to change. After 35 years of pensionable service, members contribute only 1% of pensionable earnings.

Calendar Year	2013(1)	2014(1)	2015(1)	2016(2)	2017(2)	2018(2)
Contribution rates on earnings **up to** the maximum covered by the CPP/QPP	6.85%	7.50%	8.15%	8.80%	9.47%	9.52%
Contribution rates on any earnings **over** the maximum covered by the CPP/QPP	9.20%	9.80%	10.40%	11.00%	11.58%	11.65%

(1) Approved by Treasury Board
(2) Estimated

2. Government

a) Current Service

The government determines its normal monthly contribution as that amount which, when combined with the required member contributions in respect of current service and expected interest earnings, is sufficient to cover the cost, as estimated by the President of the Treasury Board, of all future payable benefits that have accrued in respect of pensionable service during that month and the Fund administrative expenses incurred during that month.

b) Elected Prior Service

The government matches member contributions credited under the Superannuation Account for prior service elections; however, no contributions are credited if the member is paying the double rate.

Government credits to the Pension Fund in respect of elected prior service are as described for current service; however, if the member is paying the double rate the government contribution rate is generally adjusted so that total member and government contributions match the current service cost.

c) Actuarial Excess and Surplus

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

- debit the excess of accounts available for benefits over the actuarial liability from the Superannuation Account subject to limitations, and
- deal with any actuarial surplus, subject to limitations, in the Pension Fund as it occurs, either by reducing members and/or employer contributions or by making withdrawals.

d) Actuarial Shortfall and Deficit

In accordance with the CFSA, if an actuarial shortfall is identified through a triennial statutory actuarial report,the actuarial shortfall can be amortized over a period of up to 15 years, such that the amount that in the opinion of the President of the Treasury Board will, at the end of the fifteenth fiscal year following the tabling of that report or at the end of the shorter period that the President of the Treasury Board may determine, together with the amount that the President of the Treasury Board estimates will be to the credit of the Superannuation Account at that time, meet the cost of the benefits payable in respect of pensionable service prior to 1 April 2000.

Similarly, if an actuarial deficit is identified through a triennial statutory actuarial report,the actuarial deficit can be amortized over a period of up to 15 years, such that the amount that in the opinion of the President of the Treasury Board will, at the end of the fifteenth fiscal year following the tabling of that report or at the end of the shorter period that the President of the Treasury Board may determine, together with the amount that the President of the Treasury Board estimates will be to the credit of the Pension Fund at that time, meet the cost of the benefits payable in respect of pensionable service since to 1 April 2000.

C. Summary Description of Benefits

The objective of the CF pension plan is to provide an employment earnings–related lifetime retirement pension to eligible members. Benefits to members in case of disability and to the spouse and children in case of death are also provided.

Subject to coordination with the pensions paid by the CPP, the initial rate of retirement pension is equal to 2% of the highest average of annual pensionable earnings over any period of five consecutive[1] years, multiplied by the number of years of pensionable service not exceeding 35. The pension is indexed annually with the Consumer Price Index (CPI) and the accumulated indexation may be payable at age 55 at the earliest as defined in Note 2 of section D below. Entitlement to benefits depends on either the qualifying service in the Canadian Forces or the pensionable service, as defined below in Notes 3 and 4 of section D below.

[1] Any five-year period of pensionable service selected by or on behalf of the contributor, or during any period so selected consisting of consecutive periods of pensionable service totalling five years.

Detailed notes on the following overview are provided in the following Section D.

1. Benefit Entitlement on the Basis of Qualifying Service

a) Active Members

Type of Termination	Qualifying Service in the Canadian Forces *(Note 3)*	Benefit
Retirement on completion of short engagement (an officer 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 2 years	Return of contributions *(Note 7)*
	At least 2 but less than 25 years (less than 20 years – old terms of service)	At option of member (1) deferred annuity *(Note 9)*; or (2) transfer value if under age 50 *(Note 10)*
	25 years or more (20 years or more – old terms of service)	See "Retirement for reasons other than those previously mentioned"
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, to promote economy or efficiency	Any length	Immediate annuity to which member was entitled upon completion of intermediate engagement increased to such extent as prescribed by regulation[1] *(Note 11)*
Retirement on completion of intermediate engagement (a member who has not reached retirement age and is not serving for an indefinite period of service) *(Note 6)*	25 years or more (20 years or more – old terms of service)	Immediate annuity *(Note 8)*
Compulsory retirement because of disability[2]	Less than 2 years	Return of contributions *(Note 7)*
	At least 2 but less than 10 years	At option of member (1) deferred annuity *(Note 9)*; or (2) transfer value if under age 50 *(Note 10)*
	10 years or more	Immediate annuity

[1] The CFSA limits the annuity to the immediate annuity to which the active member would be entitled if retiring because of age or disability, and the formula in the CFS Regulations (Appendix 1-D.-12) 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 the duties of any occupation.

Type of Termination	Qualifying Service in the Canadian Forces *(Note 3)*	Benefit
Compulsory retirement to promote economy or efficiency	Less than 2 years	Return of contributions
	More than 2 but less than 10 years	At option of member (1) deferred annuity *(Note 9)*; or (2) transfer value if under age 50 *(Note 10)*
	At least 10 but less than 25 years (less than 20 years – old terms of service)	At option of member (1) return of contributions; or (2) deferred annuity; or (3) transfer value if under age 50 *(Note 10)* (4) with consent of the Minister of National Defence, an immediate reduced annuity *(Note 12)*
	25 years or more (20 years or more – old terms of service)	Immediate annuity *(Note 8)*
Retirement for reasons other than those previously mentioned	Less than 2 years	Return of contributions *(Note 7)*
	At least 2 but less than 25 years (less than 20 years – old terms of service)	At option of member (1) deferred annuity *(Note 9)*; or (2) transfer value if under age 50 *(Note 10)*
	(At least 20 but less than 25 years – old terms of service)	Immediate reduced annuity
	25 years or more	Officer: - immediate reduced annuity *(Note 12)*; Other than officer: - immediate annuity *(Note 8)*

b) Benefits in Case of Death of an Active Member

Status at Death	Qualifying Service in the Canadian Forces (*Note 3*)	Benefit
Leaving no eligible spouse or children under 25 (*Notes 13 and 14*)	Less than 2 years	Return of contributions
	2 years or more	Five times the annual amount of retirement pension to which the member would have been entitled at the date of death
Leaving eligible spouse and/or children under 25	Less than 2 years	Return of contributions or an amount equal to one month's earnings of the deceased member for each year of credited pensionable service, whichever is the greater
	2 years or more	Annual allowance (*Note 15*)

c) Benefits in Case of Death of a Pensioner

Status at Death	Benefit
Leaving no eligible spouse or children under 25	Minimum death benefit (*Note 16*)
Leaving eligible spouse and/or children under 25	Annual allowance (*Note 15*)

2. Benefit Entitlement on the Basis of Pensionable Service

Member's Type of Termination	Benefit
With two or more years of pensionable service; and	
▪ Involuntary termination due to a work force reduction program and	
– With 20 years of service or more	Immediate annuity
– Age 50 or over and service 10 years of service or more	
▪ Leaving prior to age 50, except for death or disability	Deferred annuity or transfer value
▪ Leaving at age 50 or over, except for death or disability, and	
– Age 60 or over, or age 55 or over and service 30 years or more	Immediate annuity
– Otherwise	Deferred annuity or annual allowance

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 for medical and dental care costs.

Pensionable payroll means the aggregate pensionable earnings of all members 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

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

3. Qualifying Service in the Canadian Forces

Qualifying service in the Canadian Forces means service for which a Regular or Reserve Force member is paid, and includes:

- days of service in the Regular Force for which pay was authorized and periods of authorized leave of absence;
- days of service in the Reserve Force for which pay was authorized and authorized absences for maternity and parental purposes:
  - days of training or duty of less than 6 hours = half-day
  - days of Class “A” service = 1.4 days
  - periods before 1 April 1999 (when duration of period is verifiable but not the number of days) = quarter time
  - during maternity and parental leaves, days of CF service are based on service in previous 12 months

4. Pensionable Service

Pensionable service includes any period of service in the Regular Force in respect of which an active member either (1) made contributions that remain in the Superannuation Account or the Pension Fund, or (2) elected to contribute. It also includes any period of prior service for which an active member was paid a return of contributions or lump sum payment under the CFSA that he or she did elect to repay on subsequent enrolment. It also includes prior service in the Public Service of Canada, the Royal Canadian Mounted Police and the militaries of the Commonwealth of Nations that the member elected to count as pensionable service.

5. Short Engagement

Short engagement means a continuous period of service as a commissioned officer in the Regular Force for a period not exceeding nine years.

6. Intermediate Engagement

Intermediate engagement means, under the old terms of service, 20 years of continuous service as a member of the Regular Force. Under the new terms of service, an intermediate engagement is 25 years of continuous service as a member of the Regular Force.

7. 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 member into the Superannuation Account and/or the Pension Fund together with interest. Interest is calculated at the quarterly Pension Fund rate each quarter on the accumulated contributions with interest as at the end of the previous quarter.

8. 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 annual pensionable earnings (Note 1) of the active member over any period of five[1] consecutive[2] 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 a percentage of the indexed CPP annual pensionable earnings[3] (or, if lesser, the indexed five-year[1] pensionable earnings

[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] Any five-year period of pensionable service selected by or on behalf of the contributor, or during any period so selected consisting of consecutive periods of pensionable service totalling five years.

[3] 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.

average on which the immediate annuity is based), multiplied by the years of CPP pensionable service[1]. The applicable percentage is 0.625%.

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 15) or a minimum death benefit (Note 16) may be payable.

9. Deferred Annuity

Deferred annuity means an annuity that becomes payable to a retirement pensioner when he or she reaches age 60. The annual payment is determined as for an immediate annuity (see Note 8 above) but is adjusted to reflect the indexation (see page 33) from the date of termination to the commencement of annuity payments.

The deferred annuity becomes an immediate annuity during any period of disability beginning before age 60. If the disability ceases before age 60, the immediate annuity reverts to the original deferred annuity.

10. Transfer Value

Active members who, at their date of termination of pensionable service, are under age 50 and who are eligible for a deferred annuity may elect to transfer the commuted value of their benefits, determined in accordance with the regulations, to

- a locked-in Registered Retirement Savings Plan of the prescribed kind; or
- another pension plan registered under the *Income Tax Act*; or
- a financial institution for the purchase of a locked-in immediate or deferred annuity of the prescribed kind.

11. Annuity Payable upon Retirement During an Indefinite Period of Service

For an active member who has not reached retirement age and who, while on an indefinite period of service after completing an intermediate engagement, ceases to be a member of the Regular Force for any reason other than disability, or to promote economy or efficiency, the 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 consecutive 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 consecutive five-year employment earnings average at that date reduced by 5% 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 member's rank; or

[1] 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.

- in the case of a member other than an officer, the age at the date of retirement is less than the retirement age applicable to the member's rank or the period of service in the Regular Force is less than 25 years, whichever is the lesser.

12. Reduced Immediate Annuity

Reduced immediate annuity means an immediate annuity for which the annual amount of the annuity as determined in Note 8 is reduced as stated below.

With the consent of the Minister of National Defence, an active member 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 active member at the time of retirement is less than the retirement age applicable to the member's rank,

whichever is the lesser.

An active member who, not having reached retirement age, ceases to be a member of the Regular Force for any reason other than disability, 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 member'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.

13. Eligible Surviving Spouse or Common-Law Partner

Eligible surviving spouse means the surviving spouse or common-law partner of an active member or pensioner except where

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

(b) the pensioner married or began a common-law relationship at age 60 or over, unless after such marriage or partnership the pensioner either

- became a plan contributor again, or
- made an optional survivor benefit election within 12 months following the marriage to accept a reduced pension so that the new spouse would be eligible for a survivor pension. 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.

14. Eligible Surviving Children

Eligible surviving children are all surviving children of an active member or pensioner who are either under age 18, or age 18 or over but under 25 and in full-time attendance at a school or university.

15. Annual Allowance for Eligible Survivors

Annual allowance means, for the eligible surviving spouse and children of an active member or pensioner, an annuity that becomes payable immediately upon the death of that individual. The amount of the allowance, called a "basic allowance", is equal to 1% of the highest average of annual pensionable earnings of the active member 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 or a common-law partner is equal to the basic allowance except in the case where the spouse became eligible to a survivor pension 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 coordinated 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 16) is payable to the estate upon the death of the last survivor.

16. Minimum Death Benefit

If upon the death of an active member 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 active member or to the named beneficiary under CFSA Part II, if any exists

(a) for an active member who was not a member of the Regular Force on 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 active member;

(b) for an active member who was a member of the Regular Force on 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 active member was or would have been entitled at the time of his or her death.

17. 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 partnership), a lump sum can be transferred upon application supported by a court order or by mutual consent agreement, from the amounts in the Superannuation Account and the Pension Fund to the credit of an active member or pensioner. As at the transfer date, the maximum transferable amount is half the value of the retirement pension accrued by the active or former member 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 active member or pensioner are then reduced accordingly.

Appendix 2 - RCA Benefit Provisions

This appendix describes the Canadian Forces – Regular Force pension benefits financed through retirement compensation arrangements RCA rather than through the CFSA registered provisions using the Superannuation Account and the Pension Fund. As described below, RCAs are pension plans not subject to the benefit limitations that apply to registered pension plans because they are taxed on a current rather than on a deferred basis.

Effective 1 May 1995, RCA was established pursuant to the *Special Retirement Arrangements Act* (SRAA) to provide for all pension benefits in excess of those that may be paid under the CFSA but are limited to be in accordance with the *Income Tax Act* restrictions on registered pension plans.

The following benefits are currently provided under RCA to the extent that they are in excess of the *Income Tax Act* limit.

Benefit	CFSA **Registered Provisions limit**
Survivor allowance for service from 1 January 1992 onward (see Appendix 1-D.-11)	Pre-retirement death • Maximum spouse allowance is two-thirds of the greater of A and B; and • Maximum aggregate dependants' allowance is the greater of A and B, where A is the amount of member annuity earned to date of death, and B is the hypothetical amount of member annuity earned to age 65 where the average annual salary is limited to 1.5 times the average YMPE Post-retirement death The amount of spouse allowance is limited in any year to a maximum of two-thirds the retirement benefit that would have been payable to the member in that year.
Minimum lump sum death benefit (see Appendix 1-D.-12)	Pre-retirement death The amount of pre-retirement death benefit where the member has no eligible dependants is limited to the greater of the member contributions with interest and the present value of the member's accrued benefits on the day prior to death. Post-retirement death If the member has no eligible dependants at retirement, then the minimum death benefit is limited to the member contributions with interest.
Excess pensionable earnings (provided since 1 May 1995 for service since then)	The highest consecutvie average pensionable earnings is subject to a prescribed yearly maximum that varies by calendar year and the registered plan's benefit formula. The calendar year 2014 Maximum Pensionable Earnings was $155,000.

Appendix 3 - Assets, Accounts and Rates of Return

A. Assets and Accounts Available for Benefits

The government has a statutory obligation to fulfill the pension promise enacted by legislation to members of the Canadian Forces – Regular Force. Since 1 April 2000, the government has earmarked invested assets (the Pension Fund) to meet the cost of pension benefits.

With respect to the unfunded portion of the CF pension plan, accounts available for benefits were established to track the government's pension benefit obligations such as the Superannuation Account, for service prior to 1 April 2000, and the RCA Account for benefits in excess of those that can be provided under the Income Tax Act limits for registered pension plans.

1. Canadian Forces Superannuation Account

CFSA member contributions, government costs and benefits earned up to 31 March 2000 are tracked entirely through the CFSA Superannuation Account, which forms part of the Accounts of Canada.

The Superannuation Account was credited with all CFSA member contributions and government costs prior to 1 April 2000, as well as with prior service contributions and costs for elections made prior to 1 April 2000 for periods before 1 April 2000 but credited after that date. It is charged with both the benefit payments made in respect of service earned under the Superannuation Account and the allocated portion of the plan administrative expenses.

The Superannuation Account is credited with interest 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 Superannuation Account by the government in recognition of the amounts therein. Interest is credited every three months on the basis of the average yield for the same period on the combined Superannuation Accounts of the Public Service, Canadian Forces and RCMP pension plans.

Table 20 Reconciliation of Balances in Superannuation Account
($ millions)

Plan Year	2011	2012	2013	2011-2013
Public Accounts opening balance	45,449	45,995	46,269	45,449
Adjustment made by PWGSC	41	-	-	41
INCOME				
Interest earnings	2,887	2,680	2,551	8,118
Employer contributions	3	3	3	9
Member contributions	3	3	3	9
Transfers received	2	-	-	2
Actuarial liability adjustments	-	-	-	-
Subtotal	2,936	2,686	2,557	8,138
EXPENDITURES				
Annuities	2,332	2,364	2,398	7,094
Pension divisions	41	33	45	119
Return of contributions	-	-	-	-
Pension transfer value payments	2	-	4	6
Transfers to other pension plans	-	-	1	1
Minimum benefits	-	-	(1)	(1)
Administrative expenses	*15*	*15*	*22*	*52*
Subtotal	2,390	2,412	2,469	7,271
Public Accounts closing balance	45,995	46,269	46,357	46,357

Since the last valuation, the Superannuation Account balance has grown by $0.9 billion (a 2.0% increase) to reach $46.4 billion as at 31 March 2013.

2. Canadian Forces Pension Fund

Since 1 April 2000, CFSA contributions (except for prior service elections made prior to 1 April 2000) have been credited to the Pension Fund. The Pension Fund is invested in the financial markets with a view to achieving maximum rates of return without undue risk.

The Pension Fund has been credited with all CFSA contributions since 1 April 2000, as well as with prior service contributions in respect of elections made since that date. The Pension Fund is also credited with the net investment returns generated by the capital assets managed by the Public Sector Pension Investment Board (PSPIB). It is debited with both the benefit payments made in respect of service earned and prior service elections made since 1 April 2000 and the allocated portion of the plan administrative expenses.

Table 21 Reconciliation of Balances in Pension Fund
($ millions)

Plan Year	2011	2012	2013	2011-2013
Opening balance	9,145	11,327	12,719	9,145
INCOME				
Interest earnings	1,376	363	1,413	3,152
Employer contributions	772	797	847	2,416
Member contributions	307	323	364	994
Transfers received	11	9	19	39
Actuarial liability adjustments	-	249	249	498
Subtotal	*2,466*	*1,741*	*2,892*	*7,099*
EXPENDITURES				
Annuities	191	293	271	755
Pension divisions	19	19	32	70
Return of contributions	-	-	-	-
Pension transfer value payments	45	-	112	157
Transfers to other pension plans	-	1	1	2
Minimum benefits	2	1	2	5
Administrative expenses	27	35	45	107
Subtotal	*284*	*349*	*463*	*1,096*
Closing balance	11,327	12,719	15,148	15,148

Since the last valuation, the Pension Fund balance has increased by $6.0 billion (a 65.6% increase) to reach $15.1 billion as at 31 March 2013.

3. Canadian Forces RCA Account

The amount in the RCA account available for benefits is composed of the recorded balance in the Retirement Compensation Arrangements Account, which forms part of the Public Accounts of Canada, and a tax credit (CRA refundable tax). Each calendar year, a debit is made from the RCA Account such that in total roughly half of the recorded balances in the Account are held as a tax credit (CRA refundable tax).

No formal debt instrument is issued to the RCA Account by the government in recognition of the amounts therein. Interest is credited every three months on the basis of the average yield for the same period on the combined Superannuation Accounts of the Public Service, Canadian Forces and RCMP pension plans.

Table 22 Reconciliation of Balances in RCA Account
($ millions)

Plan Year	2011	2012	2013	2011-2013
Public Accounts opening balance	255.8	286.8	307.6	255.8
INCOME				
Interest earnings	18.0	17.6	17.9	53.5
Employer contributions	50.8	27.4	29.0	107.2
Member contributions	2.5	2.2	2.4	7.1
Transfers received	0.0	0.0	0.0	0.0
Actuarial liability adjustments	0.0	0.0	0.0	0.0
Subtotal	*71.3*	*47.2*	*49.3*	*167.8*
EXPENDITURES				
Annuities	2.6	4.0	3.9	10.5
Pension divisions	0.1	0.3	0.2	0.6
Return of contributions	0.0	0.0	0.0	0.0
Pension transfer value payments	0.0	0.0	1.2	1.2
Transfers to other pension plans	0.5	0.0	0.0	0.5
Minimum benefits	0.0	0.0	0.0	0.0
Transfer to Canada Post	0.0	0.0	0.0	0.0
Amount transfer to CRA	37.1	22.1	21.6	80.8
Subtotal	*40.3*	*26.4*	*26.9*	*93.6*
Public Accounts closing balance	286.8	307.6	330.0	330.0
Refundable tax	275.4	297.5	319.1	319.1

Since the last valuation, the RCA Account balance has grown by $74 million (a 29.0% increase) to reach $330 million as at 31 March 2013, and the refundable tax has increased by $81 million (a 33.9% increase) to reach $319 million.

B. Rates of Interest (Return)

The rates of interest in respect of the Superannuation Account were calculated using the foregoing entries. The results were computed using the dollar-weighted approach and assume that cash flows occur in the middle of the plan year (except for actuarial liability adjustments, which occur on 31 March). The Fund rates of return are those from the PSPIB 2013 Annual Report.

Plan Year	Superannuation Account	Pension Fund
2011	6.5%	14.5%
2012	6.0%	3.0%
2013	5.7%	10.7%

C. Sources of Asset and Accounts Available for Benefits Data

The Canadian Forces Superannuation Account, the RCA Account and the Canadian Forces Pension Fund entries shown in Section A above were taken from the Public Accounts of Canada and the financial statements of the Public Sector Pension Investment Board.

Appendix 4 - Membership Data

A. Sources of Membership Data

The valuation input data required in respect of members, former members (pensioners) and survivors is provided by the Department of National Defence (DND). Because DND does not administer the pension payments made to Regular Force pensioners, the information received from DND on former members may not be accurate since the information is not kept up to date. The pensioner information is kept internally at DND with the sole purpose of providing valuation data to the Office of the Superintendent of Financial Institutions (OSFI). An additional set of valuation data on Regular Force pensioners is extracted from master computer files maintained by the Department of Public Works and Government Services Canada (PWGSC). This second set of valuation data on pensioners provides OSFI with the ability to verify the information provided by DND.

The main valuation data file supplied by DND contains the historical status information on all members up to 31 March 2013. The valuation data file on pensioners provided by PWGSC covers the period of 1 April 2010 to 31 March 2013.

B. Validation of Membership Data

1. Status-Related Tests

The following status tests were performed on the main valuation data file:

- a consistency check that a status could be established for each record of a member. The status of a member may change over time but at a given point in time it can be only one of the following: contributor, outstanding termination, pensioner, deceased leaving an eligible survivor;
- a consistency check of the changes in status of a member during the intervaluation period; e.g.
  - if a contributor record indicated that the member retired, then a pensioner record should exist; and
  - if a contributor or pensioner record indicated that the member died leaving an eligible survivor, then a corresponding survivor record should exist;
- a reconciliation between the status of members as at 31 March 2013 from the current valuation data and the status of the members as at 31 March 2010 from the previous valuation data.

2. Benefit-Related Tests

Consistency tests were performed to ensure that all information required to value the member benefits based on individual statuses as at 31 March 2013 was included, by verifying that

a) For Active Members

- the pensionable and qualifying service was reasonable in relation to the attained age;

- the salary was included and, if not, a salary was calculated by updating a salary rate from a previous year with an average earnings increase or, failing that, the average salary rate for that rank, sex, age and service was used.

b) For Pensioners and Survivors in Receipt of an Annuity

- the amount of the annuity, including indexation, was included; and
- the benefits were indexed up to 1 January 2013.

c) For Adjustments to Status and Benefit Data

- appropriate adjustments were made to the basic data, after consulting with the data providers, based on the omissions and discrepancies identified by the tests described herein and other additional tests.

C. Membership Data

The following tables show the detailed reconciliation of membership data since the last valuation. Detailed membership data upon which this valuation is based are shown in Appendix 12.

Table 23 Reconciliation of Contributors

	Male			Female			
	Officer	Other Rank	Total	Officer	Other Rank	Total	Total
As at 31 March 2010	**13,966**	**47,255**	**61,221**	**2,851**	**7,790**	**10,641**	**71,862**
Data corrections	80	(57)	23	27	(35)	(8)	15
New Contributors							
New entrants	1,655	6,139	7,794	352	900	1,252	9,046
Rehired /cash-out	84	884	968	18	126	144	1,112
Rehired/pensioners Part I	170	498	668	39	77	116	784
Rehired/pensioners Part I.1	10	55	65	2	16	18	83
Subtotal	1,919	7,576	9,495	411	1,119	1,530	11,025
Changes of							
Activity Status	20	79	99	10	10	20	119
Officers/Other Ranks	271	-271	-	77	-77	-	-
Service Type	330	2150	2,480	103	531	634	3,114
Subtotal	621	1,958	2,579	190	464	654	3,233
Lump sum terminations							
Return of contribution	(344)	(1,582)	(1,926)	(82)	(242)	(324)	(2,250)
Transfer value	(281)	(2,226)	(2,507)	(83)	(289)	(372)	(2,879)
Subtotal	(625)	(3,808)	(4,433)	(165)	(531)	(696)	(5,129)
Pensionable terminations							
Disability (3A)	-	(2)	(2)	-	(1)	(1)	(3)
Disability (3B)	(234)	(2,045)	(2,279)	(72)	(494)	(566)	(2,845)
Death	(24)	(114)	(138)	(5)	(11)	(16)	(154)
Retirement							
Deferred	(310)	(1,508)	(1,818)	(92)	(266)	(358)	(2,176)
Immediate	(1,148)	(2,350)	(3,498)	(131)	(252)	(383)	(3,881)
Subtotal	(1,716)	(6,019)	(7,735)	(300)	(1,024)	(1,324)	(9,059)
As at 31 March 2013	**14,245**	**46,905**	**61,150**	**3,014**	**7,783**	**10,797**	**71,947**

Table 24 Reconciliation of Pensioners[1]

	Male			Female			
	Officer	Other Rank	Total	Officer	Other Rank	Total	Total
Retirement Pensioners							
As at 31 March 2010	16,582	54,007	70,589	848	2,887	3,735	74,324
Data corrections	154	(415)	(261)	81	(8)	73	(188)
New pensioners	1,468	3,848	5,316	228	513	741	6,057
Terminations							
Death	(1,202)	(4,014)	(5,216)	(33)	(33)	(66)	(5,282)
Rehired	(156)	(515)	(671)	(39)	(78)	(117)	(788)
As at 31 March 2013	16,846	52,911	69,757	1,085	3,281	4,366	74,123
Disability Pensioners (3A)							
As at 31 March 2010	147	2,058	2,205	16	71	87	2,292
Data corrections	(48)	(1,079)	(1,127)	-	(2)	(2)	(1,129)
New pensioners	-	2	2	-	1	1	3
Terminations							
Death	(11)	(104)	(115)	(1)	-	(1)	(116)
As at 31 March 2013	88	877	965	15	70	85	1,050
Disability Pensioners (3B)							
As at 31 March 2010	882	9,424	10,306	225	1,551	1,776	12,082
Data corrections	69	1,061	1,130	13	(7)	6	1,136
New pensioners	242	2,038	2,280	73	493	566	2,846
Terminations							
Death	(30)	(441)	(471)	(3)	(10)	(13)	(484)
Rehired	-	(2)	(2)	-	-	-	(2)
As at 31 March 2013	1,163	12,080	13,243	308	2,027	2,335	15,578

[1] Includes deferred pensioners.

Table 25 Reconciliation of Spouse Survivors

	Widows	Widowers	Total
As at 31 March 2010	22,886	116	23,002
Data corrections	167	3	170
New from contributors	87	8	95
New from Pensioners	3,318	36	3,354
Spouse deaths	(3,465)	(6)	(3,471)
As at 31 March 2013	22,993	157	23,150

Table 26 Reconciliation of Survivors - Children/Students

	Children	Students	Total
As at 31 March 2010	456	394	850
Data corrections	54	73	127
New from contributors	94	18	112
New from Pensioners	83	43	126
Termination of Benefits	(41)	(424)	(465)
Eligible as Student	(185)	185	-
As at 31 March 2013	461	289	750

Appendix 5 - CFSA Valuation Methodology

A. Plan Assets and Accounts Available for Benefits

1. Canadian Forces Superannuation Account

The amount in the Superannuation Account available for benefits consists essentially of the recorded balance of the Superannuation Account in the Accounts of Canada. The underlying notional bond portfolio described in Appendix 3 is shown at the book value.

The only other Superannuation Account–related amount available for benefits consists of the discounted value of future member contributions and government credits in respect of prior service elections. The discounted value of future member contributions was calculated using the projected Superannuation Account yields. The government is assumed to match these future member contributions when paid at a single rate, but no contributions are credited by the government if the member is paying the double rate.

2. Canadian Forces Pension Fund

For valuation purposes, an adjusted market value method is used to determine the actuarial value of assets in respect of the Pension Fund. The method is unchanged from the previous valuation.

Under the adjusted market value method, the difference between the observed investment returns during a given plan year and the expected investment returns for that year based on the previous report assumptions, subject to a 10% corridor, is spread over five years. As a result, the actuarial value of assets is a five-year smoothed market value where the appreciation of investment gains or losses is recognized at the rate of 20% per year. The value produced by this method is related to the market value of the assets but is more stable than the market value.

The only other Pension Fund–related asset consists of the discounted value of future member contributions and government credits in respect of prior service elections[1]. The discounted value of future member contributions and government credits was calculated using the assumed rates of return on the Pension Fund.

The actuarial value of the assets determined as at 31 March 2013 under the adjusted market value method is $14,914 million and was determined as follows.

1 As defined in Appendix 1B.2.b) Elected Prior Service

Table 27 Actuarial Value of Pension Fund Assets
($ millions)

Plan Year	2009	2010	2011	2012	2013	
Actual net investment return (A)	(1,922)	1,491	1,354	334	1,379	
Expected investment return (B)	498	434	592	735	821	
Investment gains (losses) (A-B)	(2,420)	1,057	762	(401)	558	
Gains (losses) recognized immediately	0	0	0	0	0	
Investment gains (losses) to be amortized	(2,420)	1,057	762	(401)	558	
Unrecognized percentage	0%	20%	40%	60%	80%	
Unrecognized investment gains (losses)	0	211	305	(241)	446	
Market value as at 31 March 2013						15,148
Plus						
Present value of prior service contributions						198
Amount receivable from Part I.1 - Roll-over members						105
Remaining contributions for pre-2007 Reserve Force service						184
Less						
Total unrecognized investment gains (losses)						721
Actuarial value as at 31 March 2013						14,914

B. Actuarial Cost Method

As benefits earned in respect of current service will not be payable for many years, the purpose of an actuarial cost method is to assign costs over the working lifetime of the members.

As in the previous valuation, the projected accrued benefit actuarial cost method (also known as the projected unit credit method) was used to determine the current service cost and actuarial liability. 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 yearly maximum salary cap and other benefit limits under the *Income Tax Act* described in Appendix 2 were taken into account to determine the benefits payable under the CFSA and those payable under the RCA.

1. Current Service Cost

Under the projected accrued benefit actuarial cost method, the current service cost, also called the normal cost, computed in respect of a given year, is the sum of the value, discounted in accordance with the actuarial assumptions for the Pension Fund, of all future payable benefits considered to accrue in respect of that year's service. The Pension Fund administrative expenses[1] are deemed to be included in the total current service cost.

Under this method, the current service cost for an individual member will increase each year as the member approaches retirement. However, all other things being equal, the current service cost for the total population, expressed as a percentage of total

[1] As defined in Appendix 7-B.-3 Administrative Expenses

pensionable payroll, can be expected to remain stable as long as the average age and service of the total population remains constant. For a given year, the government current service cost is the total current service cost reduced by the members' contributions during the year.

2. **Actuarial Liability**

The actuarial liability with respect to contributors corresponds to the value, discounted in accordance with the actuarial assumptions for the Superannuation Account or the Pension Fund, as the case may be, of all future payable benefits accrued as at the valuation date in respect of all previous service to the credit of members. For pensioners and survivors, the actuarial liability corresponds to the value, discounted in accordance with the actuarial assumptions for the Superannuation Account or the Pension Fund, as the case may be, of future payable benefits.

3. **Actuarial Excess (Deficit)**

It is very unlikely that the actual experience will conform exactly to the assumptions that underlie the actuarial estimates. Thus, a balancing item must be calculated under this cost method to estimate the necessary adjustments. Adjustments may also be necessary if the terms of the pension benefits enacted by legislation are modified or if assumptions need to be updated.

The actuarial excess or deficit is the difference between the actuarial value of assets and the actuarial liability. The disposition of any actuarial surplus or deficit is defined in the CFSA.

4. **Government Contributions**

The recommended government contribution corresponds to the sum of:

- the government current service cost;
- the government contributions for prior service; and
- as applicable, special payments in respect of a deficit or, as the case may be, actuarial surplus credits.

C. Projected Yields and Interest Discount Rate

The projected yields (shown in Appendix 6) assumed for computing future interest credits to the Canadian Forces Superannuation Account are the projected annual yields on the combined book value of the Superannuation Accounts of the Public Service, Canadian Forces and RCMP pension plans.

The projected Superannuation Account yields were determined by an iterative process involving the following:

- the combined notional bond portfolio of the three Superannuation Accounts as at the valuation date;
- the assumed future new money interest rates (also shown in Appendix 6);
- the expected future benefits payable in respect of all pension entitlements accrued up to 31 March 2000;

- the expected future contributions for prior service elections made up to 31 March 2000; and
- the expected future administrative expenses,

taking into account that the quarterly interest credit to the Superannuation Account is calculated as if the principal at the beginning of a quarter remains unchanged during the quarter.

The projected yields (shown in Appendix 6) assumed for computing future interest earnings credited to the Canadian Forces Pension Fund were developed on the basis that the Pension Fund holds a diversified mix of assets.

The interest discount rate used in the determination of the actuarial liability and the current service cost is set equal to the expected future interest earnings on plan assets and accounts available for benefits.

D. Membership Data

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

The member data shown in Appendices 4 and 12 was provided as at 31 March 2013. This valuation is based on the member data as at the valuation date.

The information in respect of the contributions for elected prior service was provided as at 31 March 2013. Future member contributions in respect of elected prior service took into account only the payment streams that were still in effect at 31 March 2013. Only payments due after 31 March 2013 were included.

Appendix 6 - CFSA Economic Assumptions

The payment of accrued pension benefits is the responsibility of the government, therefore the likelihood of the plan being wound-up and its obligation not being fulfilled is practically nonexistent, consequently all of the assumptions used in this report are best-estimate assumptions, i.e. they reflect our best judgement of the future long-term experience of the plan and do not include margins.

A. Inflation-Related Assumptions

1. Level of Inflation

Price increases, as measured by changes in the Consumer Price Index (CPI), tend to fluctuate from year to year. In 2012, the Bank of Canada and the Government renewed their commitment to keep inflation between 1% and 3% until the end of 2016. However, with the level of inflation currently much lower than the 2% target, it is assumed that the level of inflation will increase from 1.0% in 2014 to 1.6% in 2015 and to 1.9% in 2016, before reaching its ultimate rate of 2.0% in 2017. The ultimate rate of 2.0% is 0.3% lower than the assumed rate in the previous valuation.

2. Increase in Pension Indexing Factor

The year's pension indexing factor is required in the valuation process by virtue of its role in maintaining the purchasing power of pensions. It was derived by applying the indexation formula described in Appendix 1, which relates to the assumed Consumer Price Index increases over successive 12-month periods ending on 30 September.

B. Employment Earnings Increases

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

The YMPE is required in the valuation process because the plan is coordinated with the Canada Pension Plan. The assumed increase in the YMPE for a given calendar year is derived, in accordance with the *Canada Pension Plan*, to correspond to the increase in the average weekly earnings (AWE), as calculated by Statistics Canada, over successive 12-month periods ending on 30 June. The AWE, and thus the YMPE, is deemed to include a component for seniority and promotional increases. The YMPE is equal to $52,500 for calendar year 2014. Future increases in the YMPE correspond to the assumed real[1] increase in the AWE plus assumed increases in the CPI.

The real-wage differential is developed taking into account historical trends, a possible labour shortage and an assumed moderate economic growth for Canada. Thus, a real-wage differential of 0.6% is assumed for 2015, and is assumed to gradually increase to the ultimate assumption of 1.2% by 2021. The ultimate real-wage differential assumption combined with the ultimate price increase assumption results in an assumed annual increase in nominal wages of 3.2% in 2021 and thereafter. Thus, the ultimate rate of increase for the YMPE is 3.2%, resulting from a 1.2% increase in the real AWE and a 2.0% increase in the CPI.

[1] Note that all of the real rates presented in this report are actually differentials, i.e. the difference between the effective annual rate and the rate of increase in prices. This differs from the technical definition of a real rate of return, which, for example in the case of the ultimate Fund assumption would be 4.0% (derived from 1.061/1.020) rather than 4.1%.

2. Increase in Average Pensionable Earnings

Average pensionable earnings are applicable to CFSA pension plan members only, whereas the YMPE applies to the general working population in Canada. In addition, increases in average pensionable earnings are exclusive of seniority and promotional increases, which are considered under a separate demographic assumption. Thus, the annual increase in average pensionable earnings is assumed to be 0.2% lower than the corresponding increase in the YMPE, except for years 2016 to 2018 where the annual increase in average pensionable earnings is assumed to be 0.6%, 0.5% and 0.3% lower than the corresponding increase in the YMPE. The ultimate increase in average pensionable earnings is 3.0%.

3. Increase in Maximum Pensionable Earnings (MPE)

Since the plan is coordinated with the Canada Pension Plan, the tax-related maximum pensionable earnings were derived from both the maximum annual pension accrual under a registered defined benefit plan and the YMPE. The maximum annual pension accrual of $2,696.67 for 2013 will increase to $2,770.00 for 2014, in accordance with Income Tax Regulations. Thereafter, the maximum annual pension accrual increases in accordance with the increase in the YMPE, which is the same as the assumed increase in the AWE.

Beginning with calendar year 2012, the coordination factor is 0.625%. The MPE is $155,000 for calendar year 2014.

C. Investment-Related Assumptions

1. New Money Rate

The new money rate is the nominal yield on long-term Government of Canada bonds and is set for each year in the projection period. The real yield on long-term federal bonds is equal to the new money rate less the assumed rate of inflation.

Recognizing recent experience, the annual real yield on long-term federal bonds is assumed to be 1.8% in plan year 2014, and is assumed to increase gradually to its ultimate level of 2.8% first attained in plan year 2020. This increase is consistent with the average of private sector forecasts. The ultimate real yield on long-term bonds is based on historical yields and is unchanged from the previous report.

2. Projected Yields on Superannuation Account

These yields are required for the computation of present values of benefits to determine the liability for service prior to 1 April 2000. The methodology used to determine the projected yields on the Account is described in Appendix 5. The methodology is unchanged from previous valuations.

3. Rate of Return on the Fund

The expected annual nominal rates of return on the Fund are required for the computation of present values of benefits to determine the liability for service since 1 April 2000 and the current service cost. The following sections describe how the rates of return on the Fund are determined.

a) Investment Strategy

Since 1 April 2000, invested assets resulting from transferred amount equal to the government and employee contributions, net of benefit payments and administrative expenses, are invested in capital markets through the Public Sector Pension Investment Board (PSPIB). PSPIB invests funds to maximize returns without undue risk of loss according to the investment policy set and approved by its Board of Directors that take into account the needs of contributors and beneficiaries, as well as financial market constraints. For the purpose of this report, the investments have been grouped into three broad categories: equities, fixed income securities and real assets. Equities consist of Canadian, foreign developed market and emerging market equities. Fixed income securities consist of bonds which are usually a mix of federal, provincial, corporate and real return bonds. Real assets include such categories as real estate and infrastructure.

As at 31 March 2013, PSPIB assets consisted of 62% equity, 20% fixed income securities (including world inflation-linked bonds) and 18% real assets (including asset classes such as real estate, infrastructure and renewable resources). PSPIB has developed a long-term target Policy Portfolio (approved by its Board of Directors on 13 November 2013 and subject to an annual review), which consists of 54% equity, 18% fixed income securities and 28% real assets. The Policy Portfolio asset mix weights represent long-term targets. Therefore, the initial asset mix is derived using the actual investments reported by PSPIB as at 31 March 2013.

As PSPIB Policy Portfolio reflects long-term expectations, it is assumed that the asset mix will converge slowly toward the Policy Portfolio. The ultimate asset mix is reached in plan year 2018 and consists of 55% equity, 20% fixed income securities (including 2% cash) and 25% real assets. Net cash flows (contributions less expenditures, disregarding special payments) are expected to become negative during plan year 2028 and a portion of investment income will therefore be required to pay benefits. Changes to the assumed asset mix may be required in the future to reduce funding risks and to take into account the maturity of the plan.

Table 28 shows the assumed asset mix for each plan year throughout the projection period.

Table 28 Asset Mix
(in percentage)

Plan Year	Fixed Income Securities	Cash	Canadian Equity	U.S. and Foreign Equity	Emerging Market Equity	Real Assets
2014	18	2	22	32	8	18
2015	18	2	21	32	8	19
2016	18	2	20	31	8	21
2017	18	2	20	29	8	23
2018+	18	2	20	27	8	25

b) Real Rates of Return by Asset Type

Real rates of return are required in order to discount benefits payable in the future for the determination of the actuarial liability and current service cost. They are assumed for each year of the projection period and for each of the main asset categories in which Pension Fund assets are invested. All real rates of return described in this section are shown before reduction for assumed investment expenses. Subsection c) describes how the returns are adjusted for investment expenses.

In addition, the assumed real rate of return for each asset class includes an allowance for rebalancing and diversification to take into account the beneficial effect of reduced volatility that comes from diversification within a portfolio. If the expected rates of return for each asset class were not increased to reflect their respective share of this allowance, then the expected long-term portfolio rate of return calculated as the weighted average rate of return of each asset class would be underestimated.

The real rates of return were developed by looking at historical returns (expressed in Canadian dollars) and adjusting the returns upward or downward to reflect expectations that differ from the past. Future currency variations will impact the real rates of return over the projection period, creating gains and losses. However, as the projection period is long, these gains and losses are expected to offset each other over time. Hence, it is assumed that currency variations will not have an impact on the long-term real rates of return.

With the exception of fixed income securities and cash, real rates of return for all asset classes are generally assumed to be constant for the entire projection period. The current context of extremely low yields and the general expectations that yield will increase over the coming years are reflected in the expected fixed income securities' short-term real rates of return. A constant real rate of return is assumed for more volatile asset classes, reflecting the difficulty to predict yearly market returns.

Fixed Income Securities

PSPIB currently has 20% of its portfolio invested in fixed income securities, including Canadian fixed income, world government bonds, world inflation-linked bonds and cash. It is assumed that the proportion invested in fixed income securities will remain at 20% of Pension Fund assets for the entire projection period.

It is assumed that, excluding cash, fixed income securities consist of 45% federal bonds, 15% provincial bonds, 15% corporate bonds and 25% inflation-linked bonds.

The assumed real yield on long-term federal bonds is expected to increase from 1.5% at the beginning of plan year 2014 to an ultimate of 2.8% at the end of plan year 2019. This increase in real yield is consistent with the average private sector forecasts. The initial spreads over the long-term federal bond real yield are assumed to be 110 basis points for long-term provincial bonds and 155 basis points for corporate bonds. These spreads are higher than in the last report and reflect the current economic environment. The ultimate spreads for provincial and corporate bonds are assumed to be 50 basis points and 90 basis points, respectively, and are reached at the end of plan year 2018. Corporate bond spreads are net of the expected default rate. Real return bonds, on the other hand, usually have a lower real yield than long-term federal bonds, since the real return is guaranteed and will not vary with inflation. Thus, the spread on inflation-linked bonds is assumed to be 0 basis points initially and will reach its ultimate value of -40 basis points at the end of plan year 2018.

In the previous report, it was assumed that fixed income securities would consist of long-term bonds only. However, since the current PSPIB policy portfolio is not only composed of long-term bonds, but of bonds of all duration (universe), it is assumed that fixed income securities are composed of universe bonds for the entire projection period. Since bonds with shorter duration are less affected by an increase in yield, this result in slightly higher fixed income rates of return over the first six years than it would have been assuming long-term bonds. However, the assumed real rate of return of the fixed income securities once bond yields have stabilized is lower than the corresponding assumed real rate of return of the last report (2.6% instead of 3.3% before investment expenses).

Due to their shorter duration, the yield on universe bonds is lower than the yield on long-term bonds. The spread between the long-term federal bonds and the universe of federal bonds is assumed to decrease from 85 basis points at the beginning of plan year 2014 to 50 basis points at the beginning of plan year 2018. Spreads between universe federal bonds and universe provincial, or universe corporate bonds are assumed to be similar to spreads between long-term bonds.

The expected real rates of return for individual bonds take into account the coupons and market value fluctuations due to the expected movement of their respective yield rates. As the economy continues to strengthen (following the 2008-2009 economic downturn), the long-term federal bond yield is assumed to increase between plan years 2014 and 2019 and only stabilize at the end of plan year 2019. Therefore, bond returns are quite low for the first six years of the projection. The assumed ultimate real rate of return for long-term federal bonds is 2.8% starting in plan year 2020. An ultimate fixed income real rate of return of 2.6% is assumed for 2020 and thereafter.

Equity

Currently, the assets of the pension fund are mostly invested in equity, specifically in developed world equity and emerging markets equity. In the derivation of the real rates of return for these equity investments, consideration was given to the long-term equity risk premiums for these equity classes. The rates of return also include dividends from the equities and market value fluctuations. No distinction is made between realized and unrealized capital gains.

Consistent with the assumption that risk taking must be rewarded, equity real rates of returns are developed by adding an equity risk premium to the long-term federal bond real rate of return. The historical equity risk premium over long-term government bond returns for 22 countries, representing almost 90% of global stock market value, for the 113-year and 50-year periods ending in 2012 were 3.2% and 0.9% respectively (3.4% and 1.0% for Canada)[1]. Historical equity risk premiums over the 113-year period were higher than expected due to several non-repeatable

1 Source: Elroy Dimson, Paul Marsh and Mike Staunton, Credit Suisse Global Investment Returns Yearbook 2013.

factors (mainly diversification and globalization). As a result, the long-term expected equity risk premium is assumed to be lower than what was realized in the past 113 years. However, the equity risk premium is assumed to be higher in the first six years of the projection, reflecting assumed low bond returns over the same period, before reaching its ultimate rate of 2.2% for Canadian and foreign developed markets. The equity risk premium for emerging market equities is expected to be 100 basis points higher than for Canadian and foreign developed market equities, reflecting the additional risk inherent with investments in emerging countries.

As described in the previous section, the long-term federal bond real rate of return is set at 2.8% for plan years 2020 and thereafter. The real rates of return are thus projected at 5.0% for developed market equities and 6.0% for emerging markets equities.

Real Assets

Real assets such as real estate and infrastructure are considered to be a hybrid of corporate bonds and equity. If these assets are considered to behave 75% like corporate bonds and 25% like developed market equities, then the assumed return should be composed of 75% of the return on corporate bonds and 25% of the return on developed market equities. Considering the inherent difficulties in modelling short-term returns for volatile assets, real assets are projected at 3.9% throughout the projection period.

Table 29 summarizes the assumed real rates of return by asset type throughout the projection period, prior to reduction for investment expenses.

Table 29 Real Rate of Return by Asset Type
(in percentage)

Plan Year	Fixed Income Securities	Cash	Canadian Equity	U.S. and Foreign Equity	Emerging Market Equity	Real Assets
2014	(3.3)	0.1	5.0	5.5	6.0	3.9
2015	(2.0)	0.0	5.0	5.0	6.0	3.9
2016	(1.9)	0.0	5.0	5.0	6.0	3.9
2017	(1.2)	0.2	5.0	5.0	6.0	3.9
2018	(0.8)	0.5	5.0	5.0	6.0	3.9
2019	0.8	0.8	5.0	5.0	6.0	3.9
2020+	2.6	1.0	5.0	5.0	6.0	3.9

c) Investment Expenses

Over the last three plan years, PSPIB’s operating and asset management expenses have decreased from 0.67% to 0.57% of average net assets. It is assumed that going forward PSPIB investment expenses will average 0.60% of average net assets. The majority of those investment expenses were incurred through active management decisions.

The active management objective is to generate returns in excess of those from the policy portfolio, after reduction for additional expenses. Thus, the additional returns from a successful active management program should equal at least the cost incurred to pursue active management. In eight of the past ten years, PSPIB's additional returns from active management exceeded related expenses. For the purpose of this valuation, it is assumed that additional returns due to active management will equal additional expenses related to active management. Those expenses are assumed to be the difference between total investment expenses of 0.6% and the assumed expenses of 0.2% that would be incurred for passive management of the portfolio considering that part of the portfolio is invested in real estate and infrastructure.

The next section shows the overall rate of return on the fund net of investment expenses.

d) Overall Rate of Return on assets of the Pension Fund

The best-estimate rate of return on total assets is derived from the weighted average assumed rate of return on all types of assets, using the assumed asset mix proportions as weights. The best-estimate rate of return is further increased to reflect additional returns due to active management and reduced to reflect all investment expenses. The ultimate real rate of return is developed as follows:

	Nominal	Real
Weighted average rate of return	6.3%	4.3%
Additional returns due to active management	0.4%	0.4%
Expected investment expenses		
Expenses due to passive management	(0.2%)	(0.2%)
Additional expenses due to active management	(0.4%)	(0.4%)
Total expected investment expenses	(0.6%)	(0.6%)
Net rate of return	6.1%	4.1%

The resulting nominal and real rates of return for each projection year are as follows:

Table 30 Rates of Return on Assets in Respect of the Pension Fund
(in percentage)

Plan Year	Nominal	Real
2014	4.3	3.3
2015	4.9	3.3
2016	5.2	3.3
2017	5.4	3.4
2018	5.5	3.5
2019	5.8	3.8
2020	6.1	4.1
2021+	6.1	4.1
2014-2018	5.1	3.4
2014-2023	5.5	3.7

It is assumed that the ultimate real rate of return on investments will be 4.1%, net of all investment expenses. This represents a reduction of 0.1% from the previous valuation. The real rates of return over the first six years of the projection are on average 0.8% lower than assumed in the previous valuation. The real rate of return on assets takes into account the assumed asset mix as well as the assumed real rate of return for all categories of assets. The nominal returns projected for the Pension Fund are simply the sum of the assumed level of inflation and the real return.

4. **Transfer Value Real Interest Rate**

Commuted values are calculated in accordance with the Standards of Practice published by the Canadian Institute of Actuaries. In particular, the real interest rates to be used for the computation of commuted values as at a particular date are as follows:

First 10 years: $r_7 + 0.90\%$

After 10 years: $r_L + 0.5 \times (r_L - r_7) + 0.90\%$

Where $r_7 = r_L \times (i_7/i_L)$

r_L is the long-term real-return Government of Canada bond yield, annualized

i_L is the long-term Government of Canada benchmark bond yield, annualized and

i_7 is the 7-year Government of Canada benchmark bond yield[1], annualized

The obtained rates of interest are rounded to the next multiple of 0.10%.

For example, for plan year 2016, the assumed real rates of interest are 2.4% for the first 10 years and 2.7% thereafter. These rates were derived from the assumed 2016 CPI increase and the assumed 2016 long-term Government of Canada benchmark bond yield which corresponds to the new money rate in this valuation.

[1] It was deemed to be equal to 90% of the long-term Government of Canada benchmark bond yield.

5. Summary of Economic Assumptions

The economic assumptions used in this report are summarized in the following table.

Table 31 Economic Assumptions[1]
(As a percentage)

	Inflation		Employment Earning Increases				Interest	
Plan Year	CPI Increase[2]	Pension Indexing[3]	YMPE[3]	Average Pensionable Earnings[4]	Maximum Pensionable Earnings[3,5]	New Money Rate	Projected Yield on Account	Projected Return on Fund
2014	1.0	**0.9**	**2.7**	2.5	**2.7**	2.8	5.4	4.3
2015	1.6	1.3	2.2	2.0	2.2	3.2	5.1	4.9
2016	1.9	1.9	2.6	2.0	2.6	3.6	4.8	5.2
2017	2.0	2.0	2.8	2.3	2.8	4.0	4.6	5.4
2018	2.0	2.0	2.9	2.6	2.9	4.4	4.4	5.5
2019	2.0	2.0	3.0	2.8	3.0	4.7	4.3	5.8
2020	2.0	2.0	3.1	2.9	3.1	4.8	4.3	6.1
2021	2.0	2.0	3.2	3.0	3.2	4.8	4.2	6.1
2022	2.0	2.0	3.2	3.0	3.2	4.8	4.1	6.1
2023	2.0	2.0	3.2	3.0	3.2	4.8	4.1	6.1
2025	2.0	2.0	3.2	3.0	3.2	4.8	4.0	6.1
2030	2.0	2.0	3.2	3.0	3.2	4.8	4.0	6.1
2035	2.0	2.0	3.2	3.0	3.2	4.8	4.6	6.1
2040+	2.0	2.0	3.2	3.0	3.2	4.8	4.8	6.1

As a reference, for periods ending December 2012, the following table was prepared based on the Canadian Institute of Actuaries Report on Canadian Economic Statistics 1924-2012.

Period of Years Ending 2012	15	25	50
Level of Inflation	2.0%	2.2%	4.1%
Real Increases in Average Earnings	0.5%	0.4%	1.0%
Real Yield of Long-Term Canada Bonds	2.5%	3.9%	3.3%
Real Return on Long-Term Canada Bonds	5.5%	7.4%	3.9%
Average Real Return on Diversified Portfolios	4.0%	5.9%	4.2%

1 Bold figures denote actual experience.
2 Assumed to be effective during the Plan Year.
3 Assumed to be effective as at 1 January.
4 Assumed to be effective as at 1 April. Exclusive of seniority and promotional increases.
5 Calendar year 2014 Maximum Pensionable Earnings is $155,000.

Appendix 7 - CFSA Demographic and Other Assumptions

A. Demographic Assumptions

Given the size of the population subject to the CFSA, the plan's own experience, except where otherwise noted, was deemed to be the best model to determine the demographic assumptions. As mentioned in Appendix 1, demographic assumptions based on service were derived from the pension plan experience of the last five years and those assumptions from the previous valuation not based on 'service' were updated to reflect past experience to the extent it was deemed credible.

1. Seniority and Promotional Salary Increases

Seniority means length of service within a classification and promotion means moving to a higher paid classification.

The seniority and promotional salary increase assumption was revised to reflect the intervaluation experience. The assumed rate increased by an average of 5% for officers with 10 or fewer years of completed service and increased by an average of 12% for officers with 11 to 30 years of completed service. The assumed rate increased by an average of 8% for other ranks with 10 or fewer years of completed service and decreased by an average of 1% for other ranks with 11 to 30 years of completed service.

Table 32 Sample of Assumed Seniority and Promotional Salary Increases
(Percentage of annual earnings)

Completed Years of Qualifying Service	Officer	Other Rank
0	6.7	20.4
1	6.5	18.2
2	12.6	5.1
3	22.1	9.2
4	12.7	2.6
5	6.5	2.0
6	7.3	1.8
7	5.4	1.5
8	4.4	1.1
9	4.0	1.0
10	3.8	0.9
15	2.4	1.2
20	1.6	1.3
25	1.3	1.1
30	1.1	0.9

2. New Contributors

It is assumed that the distribution of new members by age and sex will be the same as that of members with less than one year of service at the valuation date, and that the number of new contributors will be such that the total number of contributors remains constant over the projection period.

The initial salary of new members of a given age and sex in plan year 2014 is assumed to be the same as the corresponding experience in plan year 2013 with an economic salary increase for plan year 2014. Initial salary is assumed to increase in future years in accordance with the assumption for average earnings increases.

3. Pensionable Retirement

The assumed rates of pensionable retirement were revised to reflect the intervaluation experience. There were generally fewer male retirements than expected. The female exposure count was very low, and 50% credibility was given to the previous assumption. Under the old terms of service, the retirement rate assumption was decreased for male officers by an average of 29% from the previous valuation, while it was decreased by an average of 3% for female officers. For male officers under the new terms of service the retirement rate assumption was decreased by an average of 16% from the previous valuation while the rates for female officers were increased on average by 3%.

For male other ranks under the old terms of service, the retirement rate assumption was decreased by an average of 40% from the previous valuation and was decreased by an average of 9% for female other ranks. For male other ranks under the new terms of service, the retirement rate assumption was decreased by an average of 22% from the previous valuation and was decreased by an average of 5% for female other ranks.

The following table provides sample rates of pensionable retirement.

Table 33 Sample of Assumed Rates of Retirement
(Per 1,000 individuals)

	Old Terms of Service				New Terms of Service			
	Officer		Other Rank		Officer		Other Rank	
Completed Years of Qualifying Service	Male	Female	Male	Female	Male	Female	Male	Female
19	83	116	85	80	-	-	-	-
20	23	145	22	82	-	-	-	-
21	12	126	5	68	-	-	-	-
22	10	55	5	59	-	-	-	-
23	12	47	15	64	-	-	-	-
24	26	72	39	81	61	58	63	96
25	70	92	70	99	71	71	71	99
30	98	107	82	133	98	107	82	134
35	396	396	327	406	396	396	328	406

4. Disability Retirement

The disability incidence rate assumptions were revised to reflect the intervaluation experience. There were fewer than expected 3A (any occupation) disability retirements for both males and females during the intervaluation period. The 3A disability incidence rate assumption for males was decreased by an average of 46% from the previous valuation while the rate for females was decreased by an average of 49% .

The following table provides sample rates of 3A disability.

Table 34 Sample of Assumed Rates of 3A Pensionable Disability
(Per 1,000 individuals)

Age Last Birthday	Male	Female
20	0.1	0.1
25	0.1	0.2
30	0.0	0.3
35	0.1	0.4
40	0.2	0.6
45	0.1	0.9
50	0.3	1.3
55	0.6	1.7
59	0.9	2.4

In the previous valuation, the 3B (own occupation) disability incidence rate assumption was based on member age. After further analysis of past plan experience, it was deemed more appropriate to base this assumption on service. The 3B disability incidence rate assumption was based on experience over the last five years.

The following table provides sample rates of 3B disability.

Table 35 Sample of Assumed Rates of 3B Pensionable Disability
(Per 1,000 individuals)

Completed Years of Qualifying Service	Male Officer	Male Other Rank	Female
0	0.7	1.5	2.4
1	1.3	3.2	7.7
5	3.6	6.7	10.7
10	3.6	11.8	15.0
15	3.3	16.9	19.4
20	7.4	37.1	47.7
25	11.8	39.4	55.4
30	15.8	47.2	78.1
35	30.3	118.6	106.8

5. Withdrawal

Withdrawal means ceasing to be a member of the Regular Force for reasons other than death or retirement with an immediate annuity or an annual allowance. The withdrawal assumptions were revised to reflect the intervaluation experience.

Under the old terms of service, the assumed withdrawal rate for male officers was increased by an average of 95% from the previous valuation; the assumed withdrawal rate for female officers was increased by an average of 55% from the previous valuation.

Under the new terms of service, the assumed withdrawal rate for male officers was decreased by an average of 3% from the previous valuation; the assumed withdrawal rate for female officers was increased by an average of 53% from the previous valuation.

Under the old terms of service, the assumed withdrawal rate for non-officer males under the old terms of service was increased by an average of 6% from the previous valuation; the assumed withdrawal rate for non-officer females was increased by an average of 133% from the previous valuation.

Under the new terms of service, the assumed withdrawal rate for non-officer males was increased by an average of 2% from the previous valuation; the assumed withdrawal rate for non-officer females was increased by an average of 68% from the previous valuation.

The following table provides sample rates of withdrawal.

Table 36 Sample of Assumed Withdrawal Rates
(Per 1,000 individuals)

Completed Years of Qualifying Service	Old Terms of Service				New Terms of Service			
	Officer		Other Rank		Officer		Other Rank	
	Male	Female	Male	Female	Male	Female	Male	Female
0	99	69	81	41	99	90	81	101
1	47	40	37	15	47	41	37	30
5	26	14	48	25	26	17	48	24
10	23	29	18	16	23	16	18	13
15	7	8	9	7	7	14	9	8
18	11	24	5	24	11	19	5	22
19	-	-	-	-	14	22	14	26
20	-	-	-	-	16	25	23	30
21	-	-	-	-	19	29	32	34
22	-	-	-	-	21	32	41	38
23	-	-	-	-	24	35	51	42
24+	-	-	-	-	-	-	-	-

Not all vested members transfer the commuted value of their deferred pension upon withdrawal, and an assumption must be made as to the proportion of members opting for a deferred annuity. This assumption was revised to reflect the intervaluation experience, which indicates that fewer members than expected opted for a deferred annuity on termination. The assumed rates are the same for males and females, officers and other ranks, and decreased by an average of 51% for members terminating under the old or new terms of service.

The following table shows a sample of the assumed proportions of members electing a deferred annuity upon withdrawal.

Table 37 Sample of Assumed Proportions of Members Electing a Deferred Annuity
(Per 1,000 individuals)

Completed Years of Qualifying Service	Old Terms of Service	New Terms of Service
1	230	230
5	240	240
10	350	350
15	410	410
18	440	440
19	-	460
20	-	460
21	-	430
22	-	350
23	-	170
24+	-	-

6. Mortality

The mortality rate assumptions were revised based on the intervaluation experience.

For contributors and retirement pensioners aged 30 to 80, the assumed male mortality rates declined by an average of 8% for officers and 9% for other ranks. For the same age range, the assumed female mortality rates declined by an average of 4%.

For 3B (own occupation) disability pensioners, the mortality rate assumption is the same as that for contributors and retirement pensioners. For 3A (any occupation) male disability pensioners between the ages of 30 and 80, the assumed mortality rate declined by an average of 7% for officers and 3% for other ranks. For the same age range, the assumed female mortality rates decreased by an average of 7%.

For female surviving spouses aged 30 to 80, the assumed mortality rate increased by an average of 16%. Due to low exposure, the male survivor assumption was set equal to the 2011 base mortality projected to plan year 2014 using the longevity improvement factors of the previous actuarial report.

The following table provides sample rates of mortality.

Table 38 Sample of Assumed Rates of Mortality
(Per 1,000 individuals)

	Contributors and Retirement Pensioners			Disability (3A) Pensioners				
	Male			Male			Surviving Spouses	
Age Last Birthday	Officer	Other Rank	Female	Officer	Other Rank	Female	Male	Female
30	0.5	0.7	0.4	0.6	3.3	0.5	1.0	0.2
40	0.6	0.9	0.5	1.1	4.3	1.0	1.4	1.7
50	1.1	2.4	1.3	6.5	7.4	2.6	3.3	4.1
60	4.1	7.9	3.7	14.8	11.8	6.7	9.0	6.9
70	11.8	20.1	11.6	27.8	30.9	16.7	23.5	18.4
80	44.2	62.1	35.0	64.4	68.8	45.3	61.5	43.7
90	143.4	160.5	109.2	139.9	153.3	124.9	160.3	119.2
100	311.7	325.2	286.3	309.3	285.3	284.2	336.8	330.7
110	499.7	499.7	492.1	499.7	499.7	492.1	499.7	499.7

As shown in the 26th Actuarial Report on the Canada Pension Plan, life expectancy in Canada has been increasing constantly over the years. This trend is also observed in the Canadian Forces membership as supported by analysis of past mortality experience. Mortality rates are reduced in the future in accordance with the same longevity improvement assumption[1] used in the 26th Actuarial Report on the Canada Pension Plan. That report shows that longevity improvement has been trending downwards for both males and females for ages below 60; for ages 60 and older, improvement rates appear to be stabilizing. Factors shown in the 26th Actuarial Report of the Canada Pension Plan are based on calendar years. These factors have been interpolated to obtain plan year longevity improvement factors.

The ultimate longevity improvement factors for plan years 2031 and thereafter were established by analysing the trend by age and sex of the Canadian experience over the period 1921 to 2009. Improvement factors for plan year 2015 are based on those experienced on average over the 15-year period 1994 to 2009. After plan year 2015, the factors are assumed to reduce gradually to their ultimate level by plan year 2031.

1 In this report 'longevity improvement assumption' is equivalent to the 'mortality improvement assumption' discussed in the 26th Actuarial Report on the Canada Pension Plan.

A sample of assumed longevity improvement factors is shown in the following table.

Table 39 Sample of Assumed Longevity Improvement Factors

Age Last Birthday	Initial and Ultimate Plan Year Mortality Reductions (%)			
	Male		Female	
	2015	2031+	2015	2031+
30	2.39	0.80	1.11	0.80
40	1.98	0.80	1.42	0.80
50	1.42	0.80	1.11	0.80
60	2.12	0.80	1.64	0.80
70	2.61	0.80	1.64	0.80
80	2.40	0.80	1.64	0.80
90	1.42	0.48	1.25	0.48
100	0.56	0.30	0.56	0.30
110	0.20	0.23	0.20	0.23

The following table shows the calculated life expectancy for contributors and healthy pensioners based on the mortality assumptions described in this section.

Table 40 Life Expectancy of Contributors and Healthy Pensioners
(Years)

Age Nearest	As at 31 March 2013			As at 31 March 2030		
	Male			Male		
	Officer	Other Rank	Female	Officer	Other Rank	Female
60	27.4	24.6	28.6	28.3	25.6	29.5
65	22.6	20.2	23.8	23.5	21.2	24.7
70	18.2	16.1	19.4	19.0	17.0	20.2
75	13.9	12.3	15.3	14.7	13.2	16.1
80	10.2	9.2	11.7	10.9	10.0	12.3
85	7.2	6.7	8.5	7.8	7.3	9.0
90	5.3	4.8	6.0	5.7	5.2	6.4

7. Family Composition[1]

The assumptions regarding spouse survivors were revised based on the intervaluation experience. The probability of leaving, upon death, a spouse eligible for a survivor pension was decreased from the previous valuation by an average of 6% for males while the previous assumption for females was maintained for this valuation. The assumption for the age of the spouse at the time of death of the member was unchanged from the previous valuation.

[1] Survivor pensions are not payable if the deceased member has less than two years of pensionable service.

Table 41 Assumptions for Survivor Spouse Allowances

Age Last Birthday	Male		Female	
	Probability of an Eligible Spouse at Death of Member	Spouse Age Difference	Probability of an Eligible Spouse at Death of Member	Spouse Age Difference
30	0.50	(1)	0.49	1
40	0.69	(1)	0.51	2
50	0.73	(2)	0.52	1
60	0.76	(3)	0.52	0
70	0.75	(3)	0.49	(1)
80	0.61	(4)	0.43	(1)
90	0.40	(6)	0.26	(5)
100	0.17	(9)	0.01	(6)

The assumptions regarding the average number of eligible children were revised for male members based on the intervaluation experience. The assumptions for female members remained unchanged from the previous valuation.

For male members, below age 30, the average number of children assumption was increased on average by 21%. Between the ages of 31 and 50, the average number children assumed to be eligible for a survivor allowance increased by an average of 4%. Above age 50, the average number of children decreased by an average of 11%.

The assumption regarding the average age of eligible children was changed from the previous report by one year at select ages. As in the previous valuation, to determine the value of pensions payable to eligible children, the rates of pension termination were assumed to be 0% prior to age 17 and 16% per annum thereafter until expiry of the benefit on the 25th birthday.

The revision to family composition assumptions has a negligible impact on the valuation results.

Table 42 Assumptions for Survivor Children Allowances

Age Last Birthday at Death	Male		Female	
	Average Number of Children	Average Age of Children	Average Number of Children	Average Age of Children
30	0.7	4	0.7	5
40	1.3	10	0.8	13
50	0.5	16	0.3	17
60	0.1	17	0.0	-
70	0.0	-	0.0	-

B. Other Assumptions

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

The division of pension benefits has almost no effect on the valuation results because the liability is reduced, on average, by approximately the amount paid to the credit of the former spouse. Consequently, no future pension benefits divisions were assumed in estimating the current service cost and liability. However, past pension benefits divisions were fully reflected in the liability. 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 Post-Retirement Death Benefit

This valuation does not take into account the minimum death benefit described in Note 16 of Appendix 1-D, with respect to deaths occurring after retirement. The resulting understatement of the accrued liability and current service cost is not material since the majority of the relatively few pensioners who die in the early years of retirement leave an eligible survivor.

3. Administrative Expenses

In the previous report, the Public Service Pension Investment Board (PSPIB) operating expenses were implicitly recognized through a reduction in the real return on the Pension Fund. In this report, the operating expenses of the PSPIB are still recognized implicitly.

All other pension plan administrative expenses are charged to both the Superannuation Account and the Pension Fund. The annual administrative expense assumption was increased from 0.4% to 0.5% of total pensionable payroll. This increase is based on the projection of administrative expenses provided by DND, which covers the next three years. For plan year 2014, the Superannuation Account is assumed to be charged with 64% of total administrative expenses, reducing by 3% each year thereafter. The future expenses expected to be charged to the Superannuation Account have been capitalized and are shown as a liability, whereas the expenses to the Pension Fund have been recognized as a part of the annual current service cost.

4. Financing of Elected Prior Service

The assumed future government credits in respect of prior service elections vary according to the financing vehicle (i.e. Superannuation Account or Pension Fund) into which the contributions are credited. The government matches member contributions made to the Superannuation Account for prior service elections; however, it makes no contributions if the member is paying the double rate. Government credits to the Pension Fund in respect of elected prior service are as described for the current service.

5. Outstanding Terminations

The information provided by DND does not allow us to make an appropriate estimate of the amounts paid from 1 April 2010 onward for terminations that occurred prior to that date. Payments owing to former active members as at 31 March 2013 were ignored in this valuation. A more in-depth analysis will be conducted in the next valuation report scheduled for 31 March 2016.

6. Disability Incidence Rates for Pensioners Under Age 60

Both deferred pensioners and pensioners receiving an annual allowance while under age 60 were assumed to have a 0% disability rate. The resulting understatement of liability and current service cost is negligible.

7. Recovery Rates for Disability Pensioners

No recoveries are assumed for disability pensioners. The resulting overstatement of liability and current service cost is negligible.

8. Sex of Surviving Spouses

The sex of each eligible surviving spouse is assumed to be the opposite of the deceased member's.

Appendix 8 - RCA Valuation Methodology and Assumptions

A. Valuation of the Amounts Available for Benefits

The amounts available for benefits comprise the recorded balance in the Retirement Compensation Arrangements Account (RCA), which forms part of the Accounts of Canada, as well as a tax credit (CRA refundable tax).

Interest is credited every three months in accordance with the actual average yield on a book value basis for the same period on the combined Superannuation Accounts of the Public Service, Canadian Forces - Regular Force and Royal Canadian Mounted Police pension plans. The actuarial value of the amounts available for benefits is equal to the book value.

B. Valuation of Liabilities

Described in this appendix are the liability valuation methodologies used and any differences in economic assumptions from those used in the CFSA valuation.

1. Terminally Funded RCA Benefits

The following RCA benefits are being terminally funded (i.e. not prefunded but on an occurrence basis):

- pre-retirement survivor benefits
- minimum death benefit

The above benefits are terminally funded because they are uncommon or of little financial significance. The pre-retirement survivor benefit becomes payable only when the average salary is less than 1.4 times the YMPE. As well, the minimum death benefit is expected to occur only with deaths at younger ages where the mortality rates are low.

2. Post-Retirement Survivor Benefits

The limit on the amount of spousal annual allowance that can be provided under the CFSA decreases at the same time the member's pension reduces due to the CPP coordination, usually at age 65.

This benefit was valued conservatively by assuming the plan limit is always coordinated with the CPP. The liability overstatement is minor because the probability of the former contributor dying prior to age 65 is small. (This overstatement tends to be offset by the understatement of accrued liability caused by terminally funding the pre-retirement survivor benefit.) The projected accrued benefit cost method was used to estimate the liabilities and current service cost for this RCA benefit.

3. Excess Pensionable Earnings

The projected accrued benefit cost method was used to estimate plan liabilities and current service costs for benefits in excess of the Maximum Pensionable Earnings (MPE).

This valuation applies the same valuation methodology that was used in the previous report. Officers are divided into specialists (doctors, dentists, etc.) and non-specialists. Also included in the specialist group are officers with salary as at 31 March 2013 in excess of the 2013 MPE. The specialists, who represent more than 70% of the RCA liabilities, are valued using the actuarial assumptions described in Appendix 6, as was the case in the previous report.

4. Administrative Expenses

To compute the liabilities and current service cost, no provision was made regarding the expenses incurred for the administration of the RCA Account. These expenses, which are not debited to the RCA Account, are borne entirely by the government and are commingled with all other government expenses.

C. Actuarial Assumptions

The valuation economic assumptions described in Appendix 6 were used without any modifications, except that the interest discount rate used to determine the present value of the RCA liabilities and RCA current service cost is one-half of the yield projected on the combined Superannuation Accounts.

D. Valuation Data

The RCA pension benefits in payment were provided as at 31 March 2013. RCA benefits expected to be paid in respect of contributors and accrued spousal allowances of current retired members were all derived from the membership data described in Appendix 4 and shown in Appendix 12.

Appendix 9 - Canadian Forces Superannuation Account Projection

Prior to 1 April 2000, the CFSA Superannuation Account tracked all government pension benefit obligations related to the CFSA. The Superannuation Account is now debited only with benefit payments made in respect of service earned before that date and administrative expenses; it is credited with prior service related to elections made prior to 1 April 2000 and interest earnings.

The results of the following projection were computed using the amounts available for benefits described in Appendix 3, the data described in Appendices 4 and 12, the methodology described in Appendix 5 and the assumptions described in Appendices 6 and 7.

The projection shows the expected cash flows and balance of the Superannuation Account if all assumptions are realized. Emerging experience that differs from the corresponding assumptions will result in gains or losses to be revealed in subsequent valuation reports.

Table 43 Superannuation Account Projection
($ millions)

Plan Year	Beginning Account Balance	Beginning Liability	Beginning Actuarial Excess	Actuarial Excess Reduction[1]	Net Payments[2]	Interest Earnings
2014	46,390	45,233	1,157	0	2,462	2,446
2015	46,374	45,116	1,259	0	2,454	2,296
2016	46,215	44,891	1,325	0	2,471	2,125
2017	45,869	44,494	1,375	0	2,497	1,994
2018	45,366	43,978	1,388	0	2,523	1,879
2019	44,721	43,332	1,389	0	2,547	1,808
2020	43,983	42,591	1,392	0	2,565	1,776
2021	43,193	41,800	1,393	0	2,579	1,701
2022	42,315	40,920	1,395	0	2,588	1,624
2023	41,351	39,955	1,397	0	2,590	1,585
2024	40,346	38,948	1,398	0	2,587	1,506
2025	39,265	37,866	1,399	0	2,577	1,463
2026	38,151	36,751	1,400	0	2,560	1,419
2027	37,010	35,608	1,401	0	2,536	1,374
2028	35,848	34,444	1,404	0	2,506	1,328
2029	34,669	33,265	1,405	0	2,472	1,281
2030	33,478	32,073	1,406	0	2,436	1,234
2040	22,371	20,958	1,413	0	1,996	959
2050	12,047	11,001	1,046	86	1,390	495

1 The actuarial excess reduction is calculated using the liabilities and Superannuation Account balance at the end of the plan year.
2 Benefit payments plus administrative expenses minus prior service contributions.

Appendix 10 - Canadian Forces Pension Fund Projection

Starting 1 April 2000, the CFSA is financed through the Canadian Forces Pension Fund. Government and employee contributions, investment earnings and prior service contributions for elections since 1 April 2000 are added to the Pension Fund. Benefit payments made in respect of service earned since that date and administrative expenses are subtracted from the Pension Fund.

The results of the following projection were computed using the data described in Appendices 4 and 12, the methodology described in Appendix 5 and the assumptions described in Appendices 6 and 7.

The projection shows the expected growth of the Pension Fund if all assumptions are realized. According to the projection, cash flows are expected to be positive until plan year 2029. Emerging experience that differs from the corresponding assumptions will result in gains or losses to be revealed in subsequent valuation reports.

Table 44 Pension Fund Projection
($ millions)

Plan Year	Expected Unrecognized Investment (Gains)/Losses	Present value of prior service contributions	Beginning Market Value of Assets[1]	Contributions[2]	Payments	Investment Earnings	Special Payments[3]	Beginning Actuarial Liability
2014	(721)	198	15,437[1]	1,183	410	680	249	17,350
2015	(327)	181	17,139	1,190	454	858	155	18,860
2016	(143)	167	18,888	1,203	498	1,000	155	20,516
2017	(112)	156	20,749	1,221	540	1,139	155	22,286
2018	-	146	22,723	1,243	600	1,267	155	24,170
2019	-	138	24,788	1,270	673	1,455	155	26,144
2020	-	130	26,994	1,305	753	1,663	155	28,258
2021	-	123	29,363	1,341	840	1,806	155	30,535
2022	-	116	31,826	1,378	935	1,955	155	32,899
2023	-	109	34,379	1,417	1,040	2,108	155	35,349
2024	-	102	37,019	1,457	1,152	2,267	155	37,880
2025	-	95	39,746	1,497	1,269	2,431	155	40,491
2026	-	88	42,561	1,541	1,390	2,601	155	43,183
2027	-	81	45,467	1,589	1,513	2,776	155	45,961
2028	-	75	48,474	1,639	1,642	2,957	155	48,832
2029	-	69	51,582	1,687	1,778	3,144	155	51,796
2030	-	64	54,789	1,735	1,918	3,337	0	54,853
2040	-	35	89,617	2,244	3,858	5,418	0	89,652
2050	-	17	130,346	3,008	6,342	7,851	0	130,363

1 As at 31 March 2013, this item includes $184 million of remaining contributions for pre-2007 Reserve Force service as well as $105 million of receivable asset from the Reserve Force pension plan for members that have rolled-over to the Regular Force pension plan.
2 Total current service cost plus prior service contributions.
3 The special payments are based on a 15-year amortization period. The President of the Treasury Board may select a shorter period of time over which to make payments.

Appendix 11 - Uncertainty of Results

A. Introduction

The projected financial status of the Pension Fund depends on many demographic and economic factors, including new contributors, average earnings, inflation, level of interest rates and investment returns. The projected long-term financial status of the Pension Fund is based on best-estimate assumptions; the objective of this section is to present alternative scenarios. The alternatives presented illustrate the sensitivity of the long-term projected financial position of the Pension Fund to changes in the future economic outlook. In this appendix, any references, in sections B and C, to assets, liabilities, surplus/(deficit), annual special payments and service cost relate to the Pension Fund.

Section B examines the sensitivity of the Pension Fund to different asset allocations. Five alternative investment portfolios are described, along with the volatility of each portfolio and the resulting impact on the Pension Fund's funding ratio and current service cost. The impact of financial market volatility on the financial status of the Pension Fund is explored in section C, where severe one-time financial shocks are applied to three investment portfolios with the purpose of quantifying the impact on the funding ratio over the short term. Lastly, the impacts of prolonged low bond yields on the Superannuation Account and on the Pension Fund due to slower than expected economic growth are analyzed in section D.

B. Sensitivity of Investment Policy

A major risk all pension plans face is funding risk – the risk that pension assets are insufficient to meet benefit obligations. If funding deficiencies or surpluses continue for an extended period of time, risk is transferred from one generation to another and may ultimately take the form of an increase or a decrease in the contribution rate.

Historically, equities have shown greater volatility than fixed income instruments (such as bonds), volatility being a measure of the magnitude of fluctuation in returns. Similarly, long-term bonds have historically shown greater volatility than shorter fixed income instruments. For instance, in the fifty, twenty-five and ten years ending in 2012, the volatility (standard deviation) of Canadian equity returns (indicated by the S&P/TSX Total Return Index) was 16.4%, 17.0% and 19.5%, respectively, as given in the Canadian Institute of Actuaries' Report on Canadian Economic Statistics 1924 – 2012. This compares with the volatility of returns of long-term federal bonds (10+ years) of 10.2%, 9.2% and 6.8% and with the volatility of returns of medium-term federal bonds (5-10 years) of 7.4%, 6.7% and 4.8% over the same periods. Higher volatility of a security's returns implies a greater risk since the range of possible outcomes of returns widens. Hence, equities are viewed as being more risky than bonds and long-term bonds are viewed as more risky than medium- or short-term bonds.

Historically, the higher volatility of equities compared to bonds has also been rewarded with higher returns. This describes the key risk-reward relationship, whereby investors seek a higher level of return over the long term, or an equity risk premium, in exchange for assuming a higher level of risk. Nevertheless, over the short term, the potential for lower returns exists along with that for higher returns due to the higher level of volatility.

Investing in a greater proportion of equities requires assuming a higher level of risk and hence the possibility of realizing a wider range of returns. Conversely, investing in lower risk fixed income instruments will tend to produce lower returns. Further, by accepting lower returns with lower risk, investment objectives may not be achieved.

The pension plan for the Canadian Forces – Regular Force represents a long-term obligation to pay pension benefits. Thus, a long-term approach must be taken to fund these obligations. Long-term Government of Canada bonds are considered risk-free and their yields are considered low. The real yield on long-term federal bonds was around 1.5% in March 2013. This is significantly below the required real return on assets of 4.1% that is needed to sustain the plan at the current contribution rates.

By investing solely in risk-free long-term federal bonds, all funding risk could be eliminated with an excessive cost and then at the detriment of current and future contributors who will have to contribute more unless benefits were decreased. If PSPIB were to switch from the current portfolio of fixed and variable income securities to a portfolio that consists of only long-term Government of Canada bonds, the current service cost of the plan would have to increase substantially in order to maintain the current funding status or benefits would have to be reduced. Neither of these is a desirable option.

The Government created the PSPIB to invest amounts equal to contributions in excess of benefits and administrative expenses with respect to service since 1 April 2000 with the purpose of maximizing investment returns without undue risk of loss. The current service cost is less than it would have been if the investment policy had been restricted to long-term government bonds. Diversifying the portfolio into a mix of fixed and variable income securities accomplishes this.

The current service cost is reduced by investing in securities that offer a higher rate of return than risk-free long-term federal bonds, but that also have a higher degree of risk or volatility. That is, funds can be invested in a mix of investments, such as equities and bonds, with the expected rate of return equal to the yield required to meet the plan's funding requirements. By investing in riskier assets, investors hope to realize the equity risk premium as their reward for taking on additional risk. An equity risk premium is the difference between the expected return on the risky asset (equity) and the expected return on a risk-free asset, such as the Government of Canada long-term bond mentioned above.

Of course, these higher returns are expected but not guaranteed, creating the very real possibility that the market will not perform as expected and liabilities will grow at a faster rate than assets for an extended period of time. This is known as market risk. Since investing solely in risk-free long-term federal bonds will not produce a return sufficient to maintain the plan at status quo, it is necessary to take some risk in order to increase the probability of earning a sufficient return. Even if investment returns materialize as expected, other assumptions may not, causing liabilities to grow at a faster rate than assets. For example, salaries or inflation may increase at a higher rate than expected. The amount of risk assumed by the plan sponsor depends on many factors, including the current funding status and economic outlook, among other things. Thus, the investment policy must balance the plan sponsor's desire for a high real rate of return with its tolerance or capacity for taking risk.

The following table shows the impact that various asset mixes would have on the funding ratio and the long-term service cost, as well as their relative volatility.

Table 45 Impact of Various Investment Policies

Portfolio	Asset Mix: Fixed Income	Asset Mix: Equity	Asset Mix: Real Assets	Real Rate of Return: First 5 Years	Real Rate of Return: Ultimate	1-year Standard Deviation	Funding Ratio as at 31 March 2013	Annual Special Payment ($ millions)	Long-term Service Cost
#1	100%	0%	0%	(4.1%)	2.8%	9.0%	50%	1,051	32.7%
#2	100%	0%	0%	(3.0%)	3.0%	7.9%	55%	918	31.0%
#3	75%	20%	5%	(0.1%)	3.2%	6.1%	66%	653	29.5%
#4	50%	35%	15%	1.5%	3.7%	7.8%	78%	384	26.0%
Best-Estimate	20%	55%	25%	3.4%	4.1%	10.9%	89%	155	23.6%
#5	0%	100%	0%	4.6%	4.6%	17.1%	103%	0	21.0%

Portfolio #1 is invested in long-term federal bonds. This portfolio does not result in a feasible scenario due to its prohibitive cost; however, its volatility is low when compared to some of the other portfolios considered.

Portfolio #2 is invested in a fixed income portfolio consisting of long-term federal, provincial, corporate and real return bonds. This diversification increases the real rate of return and reduces the volatility compared to the first portfolio since the four bond asset categories are not perfectly correlated. Although this portfolio produces a higher real rate of return compared to Portfolio #1, it is still not sufficient to ensure the plan remains fully funded while maintaining a lower current service cost. This is also a low risk, low return portfolio. Thus, a portfolio with greater diversification in variable income assets is required in order to keep funding cost to a lower level.

The following portfolios are diversified portfolios that combine equity and real return assets, such as real estate and infrastructure, to fixed income securities of various terms. Fixed income securities in the following portfolios have a shorter average maturity than portfolio #1 and portfolio #2, resulting in a lower expected fixed income return and volatility.

Portfolio #3 and portfolio #4 are more diversified than the first two portfolios and are invested 20% and 35%, respectively, in equity. This diversification combined with shorter fixed income maturities increases the real rate of return earned on these portfolios and keeps their volatility comparable and even lower than the first two portfolios since the three broad asset categories are not perfectly correlated. However, despite an increased real return and similar risk, these portfolios are still not sufficient to maintain the current funded ratio. Thus, an increase in the plan's current service cost would be required with both portfolios.

Portfolio #5 is considered riskier because it is entirely invested in equity which has much more volatile returns than bonds. This portfolio is likely to result in higher than necessary returns, resulting in either an improvement to the plan's funding ratio or a decrease to the current service cost. However, the volatility of this portfolio is quite high. By investing in a less risky portfolio, a reasonable current service cost can still be achieved along with lower volatility, and therefore, a lower probability of significant losses and large unforeseen additional contributions.

The best-estimate portfolio is invested 20% in fixed income securities, 55% in equity and 25% in real return assets in the long-term, which is close to PSPIB's current long-term asset-mix objective. Such a portfolio produces an ultimate annual real return of 4.1% net of all investment expenses (assumed to total 0.20% of assets) with a standard deviation of 10.9%.

By observing the volatility of each of the portfolios in Table 45, it can be concluded that a certain degree of risk must be undertaken in order to earn a sufficient return. Thus, an asset allocation such as the best-estimate portfolio shows that an average real return of 4.1% can be achieved with some degree of risk.

C. Financial Market Tail Events

This section focuses on the volatility present in the best-estimate portfolio and the extreme outcomes that could result. During plan year 2009, the nominal return on PSPIB assets was (22.7%) due to the economic slowdown. Such an event could be characterized as low probability (also referred to as a "tail event"). However, when these events do occur, the impact on the funding ratio is significant. This section analyzes the impacts that tail events returns would have on the Pension Fund's funding ratio. To illustrate this, returns other than the best-estimate are assumed to occur in plan year 2016. Two alternative portfolios were selected from section B to show the potential variation in tail returns of a less risky (Portfolio 4: 35% equity, 15% real estate and infrastructure, 50% fixed income) and a more risky (Portfolio 5: 100% equity) portfolio in relation to the best-estimate portfolio.

It is assumed that the returns of the three portfolios follow a normal distribution. The long-term mean and annual standard deviation for each portfolio is given in Table 45. Returns at two probability levels were selected to analyze: 1/10 and 1/50. The probabilities of earning these returns can be thought of as once every 10 and 50 years, respectively. Since the normal distribution has two tails, a left tail and a right tail, both were examined. The left tail event is the occurrence of a nominal return such that the probability of earning that return or less is equal to 1/10 (or 1/50). The right tail event is the occurrence of a nominal return such that the probability of earning that return or more is equal to 1/10 (or 1/50).

For each portfolio a nominal return is calculated at the two probability levels. The nominal returns are given in the following table.

Table 46 Tail Event Portfolio Returns

		Portfolio 4: 35% Equities/ 50% Fixed Income/ 15% Real Assets	Best-Estimate Portfolio: 55% Equities/ 20% Fixed Income/ 25% Real Assets	Portfolio 5: 100% Equities
Probability of return[1]	Tail	Nominal Return	Nominal Return	Nominal Return
1/50	Left	(10.2%)	(15.9%)	(27.2%)
1/10	Left	(4.1%)	(7.4%)	(14.0%)
1/10	Right	16.0%	20.6%	29.9%
1/50	Right	22.0%	29.1%	43.2%

Table 47 shows the impact on the projected surplus/(deficit) as at 31 March 2016 (the expected date of the next actuarial review) if the nominal return for plan year 2016 happens

[1] The probability of earning the positive returns in the table corresponds to the probability that the annual return is greater than or equal to the indicated return. Similarly, the probability of earning the negative returns in the table corresponds to the probability that the annual return is less than or equal to the indicated return.

to be equal to the returns presented in Table 46 for the best-estimate scenario. Following the various portfolio returns in plan year 2016, it is assumed that the return will revert back to its best-estimate value for plan year 2017.

Table 47 Sensitivity of the Projected Surplus/(Deficit) as at 31 March 2016
($ millions)

Assumption(s) Varied	Market Value of Assets	Liability	Surplus/ (Deficit)	Annual Special Payments[1]
None (i.e. current basis)	20,905	22,286	(1,381)	134
Investment return				
- Left Tail event at 1/50th probability	17,071	22,286	(5,215)	549
- Left Tail event at 1/10th probability	18,639	22,286	(3,647)	379
- Right Tail event at 1/10th probability	23,793	22,286	1,507	0
- Right Tail event at 1/50th probability	25,355	22,286	3,069	0

D. Impact of Prolonged Low Bond Yields

This section explores the consequences of slower than expected economic growth through a reduction in expected bond yields and variable income securities over the next 10 years. Current bond yields are much lower than their historical averages and, without stronger economic growth, might well remain low over the next few years. Over the last 15- and 50-year periods ending 31 December 2012, the average real yield of long-term Government of Canada bonds was 2.5% and 3.3%, respectively. This is much higher than the 1.5% real yield on long-term federal bonds as at March 2013. This section looks at the impact of prolonging the current period of low bond yields for another three years and reducing the ultimate long-term federal bond yield by 0.3%.

The best-estimate scenario assumes that the long-term federal bond real (nominal) yield reaches its ultimate value of 2.8% (4.8%) at the beginning of plan year 2020. This scenario assumes that economic growth will remain weak over the next three years and moderate thereafter. Consequently, the long-term federal bond nominal yield will remain at its current level for the next three years, before increasing to reach its ultimate real (nominal) value of 2.5% (4.5%) in plan year 2024. As a result, the new money rate will also be affected and will reach its ultimate value later. In addition, returns for equities and real estate and infrastructure would also be lower for the entire projection period. Thus, returns would be 0.4% per year lower on average over the next 10 years and 0.3% lower than under the best estimate scenario thereafter.

Table 48 shows the impact that such a scenario would have on the expected short-term investment returns and new money rate, as well as the impact on accrued liabilities and annual special credits/payments required to fund the Superannuation Account shortfall and the Pension Fund deficit.

1 Equal annual special payments to amortize the deficit over the next 15 years starting 31 March 2018

Table 48 Impact on the Account/Fund of Prolonged Low Bond Yields
($ millions)

Superannuation Account	Best-Estimate	Low Bond Yields	Difference
2013-2022 Average New Money Rate	4.2%	3.4%	(0.8%)
Ultimate New Money Rate	4.8%	4.5%	(0.3%)
Total Actuarial Liability	45,233	47,117	1,884
Actuarial Excess/(Shortfall)	1,157	(727)	(1,884)
Special Credits	-	70	70
Pension Fund	**Best-Estimate**	**Low Bond Yields**	**Difference**
2013-2022 Average Return Projected on Fund	5.7%	5.3%	(0.4%)
Ultimate Return Projected on Fund	6.1%	5.8%	(0.3%)
Total Actuarial Liability	17,350	18,511	1,161
Actuarial Surplus/(Deficit)	(1,715)	(2,876)	(1,161)
Special Payments	155	271	116

Prolonging low bond yields for an additional three years and reducing the ultimate long-term federal bond yield by 0.3% result in higher actuarial liability and higher special credits/payments for both, the Superannuation Account and the Pension Fund.

Appendix 12 - Detailed Information on Membership Data

In this appendix, the 'Age' and 'Service' nomenclature refers to completed years calculated at the beginning of the plan year.

Table 49 Male Officers
Number and Average Annual Earnings[1] as at 31 March 2013

Age	0-4	5-9	10-14	15-19	20-24	25-29	30-34	35+	All Years of Service
15-19	319 $19,394								319 $19,394
20-24	1,039 $30,825	345 $56,949							1,384 $37,337
25-29	656 $56,975	992 $72,595	257 $82,210						1,905 $68,513
30-34	295 $65,766	783 $84,709	814 $91,005	197 $100,213					2,089 $85,950
35-39	120 $67,235	416 $86,612	641 $97,010	750 $103,243	184 $108,707				2,111 $96,502
40-44	107 $74,801	161 $86,982	334 $96,025	441 $101,628	841 $108,869	171 $112,469			2,055 $102,039
45-49	71 $79,433	102 $94,024	139 $98,001	193 $100,955	523 $111,052	851 $112,669	179 $119,408		2,058 $108,684
50-54	48 $83,863	60 $93,780	92 $99,417	77 $105,911	173 $112,152	533 $114,235	677 $117,806	81 $127,753	1,741 $113,352
55-59	14 $110,936	20 $127,509	39 $105,169	45 $96,936	65 $105,845	90 $109,827	168 $120,563	122 $111,610	563 $112,260
>59[2]		2 $84,246	11 $92,615	3 $103,854	1 $83,067	2 $76,629	1 $95,156		20 $91,515
All Ages	2,669 $45,815	2,881 $78,431	2,327 $93,404	1,706 $102,172	1,787 $109,685	1,647 $112,956	1,025 $118,516	203 $118,052	14,245 $88,970

	31 March 2013	31 March 2010
Average age:	38.4	37.6
Average pensionable service:	15.0	14.5
Annualized pensionable payroll[3]:	$1,243,420,040	$1,145,041,586
Total PBDA[4] indexed reduction to basic annuity:	$4,149,135	$3,382,354
Total PBDA[4] indexed reduction adjustment:	$752,057	$630,130

1 As defined in Note 1 of Appendix 2-D.
2 As at 31 March 2013 these members are treated as pensioners.
3 The aggregate pensionable earnings of all contributors with less than 35 years of pensionable service.
4 PBDA means the *Pension Benefits Division Act*.

Table 50 Male Other Ranks
Number and Average Annual Earnings[1] as at 31 March 2013

Age	0-4	5-9	10-14	15-19	20-24	25-29	30-34	35+	All Years of Service
15-19	565 $35,508								565 $35,508
20-24	5,871 $47,551	1,063 $58,184							6,934 $49,181
25-29	3,844 $49,877	5,555 $59,544	579 $63,161						9,978 $56,030
30-34	1,358 $50,306	3,317 $60,516	3,725 $63,515	238 $66,737					8,638 $60,375
35-39	545 $49,779	1,174 $60,695	2,393 $63,456	2,167 $67,077	143 $71,854				6,422 $63,199
40-44	249 $49,931	486 $60,626	845 $62,792	1,455 $67,139	2,599 $71,417	320 $74,128			5,954 $67,514
45-49	132 $49,861	201 $59,718	340 $62,199	457 $65,560	1,233 $69,805	2,357 $74,785	380 $78,901		5,100 $70,983
50-54	42 $48,475	82 $60,238	107 $60,827	144 $63,083	265 $67,439	749 $72,746	1,281 $78,203	145 $82,913	2,815 $73,579
55-59	14 $47,957	24 $59,197	43 $60,567	34 $63,729	43 $66,254	62 $69,471	149 $76,004	124 $80,858	493 $71,745
>59[2]			1 $71,082		4 $56,975	1 $78,103			6 $62,847
All Ages	12,620 $48,188	11,902 $59,858	8,033 $63,289	4,495 $66,772	4,287 $70,657	3,489 $74,194	1,810 $78,168	269 $81,966	46,905 $60,855

	31 March 2013	31 March 2010
Average age:	34.8	34.1
Average pensionable service:	11.9	11.5
Annualized pensionable payroll[3]:	$2,832,355,612	$2,653,234,747
Total PBDA[4] indexed reduction to basic annuity:	$6,838,473	$6,090,207
Total PBDA[4] indexed reduction adjustment:	$1,797,924	$1,707,379

1 As defined in Note 1 of Appendix 2-D.
2 As at 31 March 2013 these members are treated as pensioners.
3 The aggregate pensionable earnings of all contributors with less than 35 years of pensionable service.
4 PBDA means the *Pension Benefits Division Act*.

Table 51 Female Officers
Number and Average Annual Earnings[1] as at 31 March 2013

Age	0-4	5-9	10-14	15-19	20-24	25-29	30-34	35+	All Years of Service
15-19	70 $18,933								70 $18,933
20-24	236 $30,580	110 $58,096							346 $39,328
25-29	152 $59,986	250 $74,911	92 $81,514						494 $71,549
30-34	80 $61,483	214 $87,643	239 $89,088	60 $96,830					593 $85,626
35-39	36 $67,267	88 $87,392	173 $100,078	176 $102,562	46 $112,466				519 $97,591
40-44	16 $66,056	57 $92,202	102 $95,114	113 $100,922	107 $107,713	11 $116,710			406 $99,082
45-49	12 $75,100	28 $83,837	52 $102,693	67 $98,757	100 $115,016	84 $111,264	6 $109,894		349 $105,193
50-54	4 $69,483	12 $103,734	22 $88,893	20 $93,673	27 $105,995	61 $114,735	34 $114,707	3 $104,196	183 $106,148
55-59	2 $82,440	3 $187,915	7 $92,308	14 $97,916	8 $112,927	8 $99,265	9 $123,466	2 $114,456	53 $109,118
>59[2]				1 $17,914					1 $17,914
All Ages	608 $45,068	762 $80,021	687 $92,792	451 $100,097	288 $110,992	164 $112,335	49 $115,726	5 $108,300	3,014 $84,230

	31 March 2013	31 March 2010
Average age:	35.8	34.6
Average pensionable service:	12.1	11.0
Annualized pensionable payroll[3]:	$253,328,042	$216,495,505
Total PBDA[4] indexed reduction to basic annuity:	$59,629	$45,784
Total PBDA[4] indexed reduction adjustment:	$7,746	$5,648

1 As defined in Note 1 of Appendix 2-D.
2 As at 31 March 2013 these members are treated as pensioners.
3 The aggregate pensionable earnings of all contributors with less than 35 years of pensionable service.
4 PBDA means the *Pension Benefits Division Act*.

Table 52 Female Other Ranks
Number and Average Annual Earnings[1] as at 31 March 2013

Age	0-4	5-9	10-14	15-19	20-24	25-29	30-34	35+	All Years of Service
15-19	55 $34,361								55 $34,361
20-24	546 $46,538	115 $57,625							661 $48,467
25-29	546 $49,420	683 $58,113	81 $61,643						1,310 $54,708
30-34	295 $48,429	614 $58,918	556 $63,550	21 $64,127					1,486 $58,643
35-39	177 $49,471	369 $58,883	536 $65,058	216 $64,858	9 $70,040				1,307 $61,205
40-44	92 $49,397	241 $58,980	327 $61,605	284 $63,355	340 $69,185	18 $75,045			1,302 $62,803
45-49	54 $47,806	141 $58,828	214 $61,178	149 $63,337	224 $68,646	221 $72,749	22 $78,763		1,025 $64,968
50-54	14 $46,545	46 $56,916	91 $60,129	79 $61,237	72 $66,423	124 $70,087	84 $77,441	4 $75,207	514 $65,872
55-59	7 $50,467	11 $55,229	19 $57,806	17 $55,341	28 $62,505	21 $66,460	17 $79,444	3 $82,212	123 $62,950
All Ages	1,786 $47,848	2,220 $58,539	1,824 $63,051	766 $63,400	673 $68,444	384 $71,653	123 $77,954	7 $78,209	7,783 $59,450

	31 March 2013	31 March 2010
Average age:	36.9	36.0
Average pensionable service:	11.1	10.5
Annualized pensionable payroll[2]:	$462,148,161	$432,144,436
Total PBDA[3] indexed reduction to basic annuity:	$70,120	$41,273
Total PBDA[4] indexed reduction adjustment:	$19,559	$12,670

1 As defined in Note 1 of Appendix 2-D.
2 The aggregate pensionable earnings of all contributors with less than 35 years of pensionable service.
3 PBDA means the *Pension Benefits Division Act*.

Table 53 Officer Male - Retirement Pensioners
Number and Average Annual Pension[1] in pay as at 31 March 2013

	Total		Account		Fund		RCA Account	
Age	Number	Average	Number	Average	Number	Average	Number	Average
<35	0	-	0	-	0	-	0	-
35-39	26	37,538	26	15,953	26	21,585	0	-
40-44	276	36,631	269	19,269	264	18,518	2	19,065
45-49	1,009	33,930	993	22,210	821	14,447	14	22,826
50-54	1,661	39,725	1,651	29,504	1,240	13,417	48	13,236
55-59	1,957	50,060	1,937	39,729	1,275	15,519	116	10,564
60-64	1,990	53,399	1,935	48,322	1,104	10,990	106	5,914
65-69	2,400	42,990	2,381	42,476	369	5,027	62	3,000
70-74	2,210	43,802	2,209	43,786	10	5,810	17	1,235
75-79	1,663	45,106	1,663	45,102	2	3,642	0	-
80-84	1,554	42,527	1,553	42,555	0	-	0	-
85-89	959	40,092	953	40,344	0	-	0	-
90-94	534	38,522	531	38,739	0	-	0	-
95+	91	30,808	90	31,151	0	-	0	-
All Ages	16,330	43,995	16,191	39,997	5,111	13,263	365	8,362

	31 March 2013	31 March 2010
Average age	67.7	67.1
Average age at retirement	48.4	48.3

Table 54 Officer Female - Retirement Pensioners
Number and Average Annual Pension[1] in pay as at 31 March 2013

	Total		Account		Fund		RCA Account	
Age	Number	Average	Number	Average	Number	Average	Number	Average
<35	0	-	0	-	0	-	0	-
35-39	15	38,615	15	15,652	15	22,963	0	-
40-44	61	37,262	60	19,569	59	18,423	1	11,861
45-49	144	30,783	143	20,172	104	13,878	6	17,475
50-54	159	35,009	153	24,572	109	15,769	5	17,616
55-59	175	40,977	166	32,316	115	15,340	6	7,071
60-64	136	45,124	126	40,461	73	13,539	9	5,607
65-69	85	32,595	80	32,009	20	10,154	3	2,243
70-74	48	33,683	48	33,576	0	-	1	5,125
75-79	34	35,061	34	35,061	0	-	0	-
80-84	28	29,377	28	29,377	0	-	0	-
85-89	32	29,410	32	29,410	0	-	0	-
90-94	16	26,376	16	26,376	0	-	0	-
95+	8	21,157	8	21,157	0	-	0	-
All Ages	941	36,231	909	28,861	495	15,251	31	9,985

	31 March 2013	31 March 2010
Average age	59.6	58.7
Average age at retirement	46.2	45.8

[1] Includes annual allowance adjustments, PBDA reductions and CPP coordination if in effect at the valuation date.

Table 55 Other Rank Male - Retirement Pensioners
Number and Average Annual Pension[1] in pay as at 31 March 2013

	Total		Account		Fund	
Age	Number	Average	Number	Average	Number	Average
<35	2	14,510	1	2,776	2	13,122
35-39	29	25,068	28	10,391	29	15,036
40-44	1,111	25,165	1,101	12,909	1,105	12,440
45-49	3,714	24,248	3,694	16,051	3,402	9,037
50-54	7,127	22,315	7,104	17,968	4,842	6,484
55-59	6,349	23,110	6,331	20,372	2,470	7,185
60-64	5,538	28,490	5,513	27,427	1,221	5,386
65-69	6,220	23,340	6,215	23,251	304	2,206
70-74	6,681	22,450	6,681	22,447	5	3,787
75-79	6,957	21,591	6,957	21,590	1	7,723
80-84	4,532	21,168	4,532	21,168	0	-
85-89	2,183	21,249	2,183	21,249	0	-
90-94	796	22,343	796	22,343	0	-
95+	109	20,330	109	20,330	0	-
All Ages	51,348	23,175	51,245	21,243	13,381	7,576

	31 March 2013	31 March 2010
Average age	66.3	65.1
Average age at retirement	44.9	44.9

Table 56 Other Rank Female - Retirement Pensioners
Number and Average Annual Pension[1] in pay as at 31 March 2013

	Total		Account		Fund	
Age	Number	Average	Number	Average	Number	Average
<35	1	13,489	0	-	1	13,489
35-39	4	22,387	3	11,290	4	13,920
40-44	146	24,309	146	12,615	142	12,023
45-49	483	22,499	476	14,895	403	9,373
50-54	1,029	19,314	1,016	15,955	577	6,349
55-59	816	19,786	798	17,905	270	6,878
60-64	352	25,798	334	24,996	84	8,718
65-69	100	21,135	99	20,909	8	5,438
70-74	84	19,231	84	19,231	0	-
75-79	35	18,328	35	18,328	0	-
80-84	29	17,999	29	17,999	0	-
85-89	8	14,169	8	14,169	0	-
90-94	3	16,761	3	16,761	0	-
All Ages	3,090	20,931	3,031	17,428	1,489	7,958

	31 March 2013	31 March 2010
Average age	55.4	53.0
Average age at retirement	42.5	41.9

[1] Include annual allowance adjustments, PBDA reductions and CPP coordination if in effect at the valuation date.

Table 57 Officer Male - 3B Pensioners
Number and Average Annual Pension[1] in pay as at 31 March 2013

Age	Total		Account		Fund		RCA Account	
	Number	Average	Number	Average	Number	Average	Number	Average
<35	13	18,216	8	3,304	13	15,870	1	4,074
35-39	20	22,859	17	7,730	20	15,128	2	11,609
40-44	59	32,285	50	16,668	57	17,466	3	25,296
45-49	159	38,298	153	25,306	143	14,717	9	12,553
50-54	257	44,791	245	32,509	229	15,189	7	9,761
55-59	245	55,910	232	43,274	218	15,948	9	20,218
60-64	187	52,522	176	46,688	142	10,958	6	8,061
65-69	96	46,437	96	44,806	31	4,153	5	5,550
70-74	35	45,824	35	45,764	0	-	1	2,127
75-79	19	33,965	19	33,965	0	-	0	-
80-84	8	21,527	8	21,527	0	-	0	-
85-89	8	27,707	8	27,707	0	-	0	-
90-94	1	20,945	1	20,945	0	-	0	-
95+	1	35,685	1	35,685	0	-	0	-
All Ages	1,108	45,918	1,049	36,304	853	14,359	43	12,667

	31 March 2013	31 March 2010
Average age	56.5	54.4
Average age at retirement	47.4	47.1

Table 58 Officer Female - 3B Pensioners
Number and Average Annual Pension[1] in pay as at 31 March 2013

Age	Total		Account		Fund		RCA Account	
	Number	Average	Number	Average	Number	Average	Number	Average
<35	6	16,487	5	3,008	6	13,980	0	-
35-39	13	19,751	11	9,285	13	10,549	2	8,746
40-44	30	26,968	27	14,909	29	14,017	0	-
45-49	49	33,930	45	22,236	43	13,908	4	15,973
50-54	68	45,008	57	30,994	63	18,467	11	11,861
55-59	56	50,262	45	38,370	53	19,967	2	14,877
60-64	31	43,976	26	37,786	21	16,559	1	33,062
65-69	17	33,222	17	31,169	6	5,575	1	1,460
70-74	1	20,300	1	20,300	0	-	0	-
75-79	2	37,595	2	37,595	0	-	0	-
80-84	0	-	0	-	0	-	0	-
85-89	0	-	0	-	0	-	0	-
90-94	1	14,994	1	14,994	0	-	0	-
All Ages	274	39,201	237	28,002	234	16,361	21	13,149

	31 March 2013	31 March 2010
Average age	52.8	49.9
Average age at retirement	45.2	44.0

[1] Include annual allowance adjustments, PBDA reductions and CPP coordination if in effect at the valuation date.

Table 59 Other Rank Male - 3B Pensioners
Number and Average Annual Pension[1] in pay as at 31 March 2013

	Total		Account		Fund	
Age	Number	Average	Number	Average	Number	Average
<30	7	8,929	0	-	7	8,929
30-34	127	12,871	48	1,573	127	12,277
35-39	343	15,372	285	5,099	343	11,135
40-44	1,365	19,931	1,312	11,031	1,326	9,602
45-49	2,726	23,107	2,657	15,825	2,450	8,548
50-54	3,064	26,210	3,036	20,326	2,393	7,773
55-59	1,619	29,448	1,603	24,913	965	8,021
60-64	830	28,874	819	26,921	328	5,847
65-69	512	22,356	511	22,195	53	1,976
70-74	431	18,600	431	18,600	0	-
75-79	403	15,767	403	15,767	0	-
80-84	318	14,521	318	14,521	0	-
85-89	109	15,045	109	15,045	0	-
90-94	33	15,473	33	15,473	0	-
95+	1	13,661	1	13,661	0	-
All Ages	11,888	23,697	11,566	18,523	7,992	8,443

	31 March 2013	31 March 2010
Average age	54.4	50.8
Average age at retirement	42.2	41.9

Table 60 Other Rank Female - 3B Pensioners
Number and Average Annual Pension[1] in pay as at 31 March 2013

	Total		Account		Fund		RCA Account	
Age	Number	Average	Number	Average	Number	Average	Number	Average
<30	2	9,925	0	-	2	9,925	0	-
30-34	13	12,791	3	1,962	13	12,338	0	-
35-39	49	14,271	27	4,139	49	11,991	0	-
40-44	302	18,904	251	10,924	293	10,127	0	-
45-49	556	21,791	515	14,951	500	8,799	1	16,602
50-54	616	23,918	575	18,893	474	8,165	0	-
55-59	325	26,421	293	22,763	208	9,218	0	-
60-64	73	23,828	67	21,632	32	9,066	0	-
65-69	20	21,715	18	19,757	5	15,732	0	-
70-74	1	24,232	1	24,232	0	-	0	-
75-79	1	16,791	1	16,791	0	-	0	-
80-84	1	6,585	1	6,585	0	-	0	-
All Ages	1,959	22,589	1,752	17,092	1,576	9,068	1	16,602

	31 March 2013	31 March 2010
Average age	50.4	48.2
Average age at retirement	42.1	41.0

[1] Include annual allowance adjustments, PBDA reductions and CPP coordination if in effect at the valuation date.

Table 61 Officer Male - 3A Pensioners
Number and Average Annual Pension[1] in pay as at 31 March 2013

	Total		Account		Fund		RCA Account	
Age	Number	Average	Number	Average	Number	Average	Number	Average
45-49	2	24,925	2	22,756	1	4,339	0	-
50-54	3	20,650	3	20,650	0	-	0	-
55-59	10	33,393	10	30,615	4	5,544	1	5,599
60-64	6	17,312	6	17,312	0	-	0	-
65-69	16	29,313	16	28,780	3	2,843	0	-
70-74	13	25,034	13	25,034	0	-	0	-
75-79	14	18,081	14	18,081	0	-	0	-
80-84	9	24,097	9	24,097	0	-	0	-
85-89	9	21,988	9	21,988	0	-	0	-
90-94	6	27,194	6	27,194	0	-	0	-
All Ages	88	24,717	88	24,255	8	4,381	1	5,599

	31 March 2013	31 March 2010
Average age	72.6	73.9
Average age at retirement	40.2	40.3

Table 62 Officer Female - 3A Pensioners
Number and Average Annual Pension[1] in pay as at 31 March 2013

	Total		Account		Fund	
Age	Number	Average	Number	Average	Number	Average
50-54	1	10,487	1	10,487	0	-
55-59	2	23,830	2	23,830	0	-
60-64	6	23,490	6	23,490	0	-
65-69	3	21,612	3	21,467	1	434
70-74	1	10,822	1	10,822	0	-
75-79	0	-	0	-	0	-
80-84	0	-	0	-	0	-
85-89	2	14,886	2	14,886	0	-
All Ages	15	20,301	15	20,272	1	434

	31 March 2013	31 March 2010
Average age	66.1	65.8
Average age at retirement	43.0	42.4

[1] Include annual allowance adjustments, PBDA reductions and CPP coordination if in effect at the valuation date.

Table 63 Other Rank Male - 3A Pensioners
Number and Average Annual Pension[1] in pay as at 31 March 2013

	Total		Account		Fund	
Age	Number	Average	Number	Average	Number	Average
35-39	1	12,116	1	5,377	1	6,739
40-44	3	15,224	3	10,048	3	5,176
45-49	44	14,273	43	12,544	29	3,056
50-54	67	18,376	67	17,289	30	2,427
55-59	49	16,816	49	16,350	9	2,540
60-64	51	16,527	51	16,007	7	3,789
65-69	136	10,358	136	10,336	1	2,992
70-74	159	10,352	159	10,352	0	-
75-79	151	11,861	151	11,861	0	-
80-84	133	11,526	133	11,526	0	-
85-89	62	14,197	62	14,197	0	-
90-94	18	12,624	18	12,624	0	-
95+	3	12,523	3	12,523	0	-
All Ages	877	12,665	876	12,410	80	2,951

	31 March 2013	31 March 2010
Average age	71.3	74.0
Average age at retirement	36.6	38.2

Table 64 Other Rank Female - 3A Pensioners
Number and Average Annual Pension[1] in pay as at 31 March 2013

	Total		Account		Fund	
Age	Number	Average	Number	Average	Number	Average
40-44	6	13,782	6	11,074	6	2,707
45-49	9	11,080	9	10,400	4	1,531
50-54	28	15,573	28	14,274	13	2,798
55-59	14	19,606	14	19,044	3	2,625
60-64	9	13,238	9	13,115	1	1,105
65-69	4	14,962	4	14,962	0	-
70-74	0	-	0	-	0	-
All Ages	70	15,313	70	14,346	27	2,509

	31 March 2013	31 March 2010
Average age	54.1	51.9
Average age at retirement	38.4	38.2

1 Include annual allowance adjustments, PBDA reductions and CPP coordination if in effect at the valuation date.

Table 65 Deferred Annuitant - Officer Male
Number and Average Annual Pension[1] in pay as at 31 March 2013

	Total		Account		Fund		RCA Account	
Age	Number	Average	Number	Average	Number	Average	Number	Average
<30	137	2,861	0	-	133	2,947	0	-
30-34	100	6,366	6	2,989	97	6,304	1	7,246
35-39	106	7,866	16	5,996	102	7,168	3	2,229
40-44	75	11,930	10	21,198	73	9,353	0	-
45-49	66	32,186	35	41,164	41	15,699	2	19,946
50-54	60	37,142	38	47,724	30	13,511	2	4,832
55-59	27	60,008	9	118,799	21	25,116	4	5,895
All Ages	571	16,063	114	44,563	497	8,058	12	7,256

	31 March 2013	31 March 2010
Average age	38.1	35.0
Average age at retirement	34.5	32.5

Table 66 Deferred Annuitant - Officer Female
Number and Average Annual Pension[1] in pay as at 31 March 2013

	Total		Account		Fund		RCA Account	
Age	Number	Average	Number	Average	Number	Average	Number	Average
<30	26	3,114	0	-	26	3,114	0	-
30-34	33	8,007	11	2,735	32	7,317	0	-
35-39	29	7,395	4	8,311	29	6,216	1	939
40-44	28	9,374	1	21,262	28	8,448	2	2,343
45-49	27	22,215	5	52,763	24	13,765	1	5,635
50-54	24	19,125	5	47,726	19	11,237	2	3,429
55-59	11	30,358	0	-	11	24,520	1	4,765
All Ages	178	12,557	26	25,644	169	9,145	7	3,269

	31 March 2013	31 March 2010
Average age	40.4	35.3
Average age at retirement	37.5	33.1

1 Include annual allowance adjustments, PBDA reductions and CPP coordination if in effect at the valuation date.

Table 67 Deferred Annuitant - Other Rank Male
Number and Average Annual Pension[1] in pay as at 31 March 2013

	Total		Account		Fund	
Age	Number	Average	Number	Average	Number	Average
<30	910	3,584	0	-	899	3,628
30-34	327	6,484	14	1,499	325	6,460
35-39	172	9,030	47	4,215	168	8,066
40-44	96	12,921	29	13,617	94	8,995
45-49	79	36,391	50	46,016	50	11,482
50-54	112	58,237	90	66,489	29	18,570
55-59	59	61,939	45	76,825	15	13,152
All Ages	1,755	12,743	275	49,020	1,580	5,622

	31 March 2013	31 March 2010
Average age	32.8	31.9
Average age at retirement	29.4	29.8

Table 68 Deferred Annuitant - Other Rank Female
Number and Average Annual Pension[1] in pay as at 31 March 2013

	Total		Account		Fund	
Age	Number	Average	Number	Average	Number	Average
<30	61	3,504	0	-	60	3,562
30-34	51	6,077	0	-	50	6,199
35-39	39	7,605	4	1,807	38	7,614
40-44	21	10,585	6	8,074	21	8,278
45-49	33	18,840	8	45,353	25	10,356
50-54	34	35,374	20	48,079	18	13,396
55-59	20	25,250	12	32,779	9	12,405
All Ages	259	13,094	50	35,856	221	7,233

	31 March 2013	31 March 2010
Average age	38.9	38.3
Average age at retirement	34.6	36.2

1 Include annual allowance adjustments, PBDA reductions and CPP coordination if in effect at the valuation date.

Table 69 Surviving Spouses - Female
Number and Average Annual Pension as at 31 March 2013

	Total		Account		Fund		RCA Account		RCA Account	
Age	Number	Average	Number	Average	Number	Average	Number	Average	Number	Average
<30	26	3,542	3	10,020	23	2,677	0	-	3	154
30-34	40	5,561	21	3,939	39	3,558	0	-	6	158
35-39	77	9,368	63	6,828	65	4,462	0	-	10	118
40-44	124	10,623	119	8,283	81	4,059	0	-	25	112
45-49	270	11,548	259	9,798	126	3,580	1	122,342	53	127
50-54	443	12,239	436	11,154	142	3,765	1	10,047	119	118
55-59	696	13,904	694	13,105	113	3,167	2	104,698	134	111
60-64	1,046	14,081	1,045	13,867	57	2,370	1	97,112	83	61
65-69	1,848	14,075	1,846	14,011	27	2,602	1	73,912	23	70
70-74	3,027	13,346	3,026	13,348	4	1,229	1	623	4	13
75-79	4,148	12,640	4,148	12,640	1	54	0	-	1	97
80-84	4,399	12,463	4,399	12,463	1	313	0	-	0	-
85-89	4,039	12,750	4,039	12,750	0	-	0	-	0	-
90-94	2,307	12,864	2,307	12,864	0	-	0	-	0	-
95+	503	11,858	503	11,858	0	-	0	-	0	-
All Ages	22,993	12,878	22,908	12,797	679	3,496	7	73,347	461	104

	31 March 2013	31 March 2010
Average age	78.1	77.0
Average age at death of member	63.3	63.1

Table 70 Surviving Spouses - Male
Number and Average Annual Pension as at 31 March 2013

	Total		Account		Fund		RCA Account		RCA Account	
Age	Number	Average	Number	Average	Number	Average	Number	Average	Number	Average
<30	1	1,656	0	-	1	1,518	0	-	1	138
30-34	3	4,634	2	837	3	4,076	0	-	0	-
35-39	4	6,963	3	7,121	2	3,245	0	-	0	-
40-44	6	6,014	3	3,216	6	4,289	0	-	2	351
45-49	8	9,832	8	7,327	6	3,293	0	-	2	145
50-54	27	16,517	23	11,242	15	4,742	1	115,038	9	134
55-59	25	11,662	24	10,919	11	2,611	0	-	7	110
60-64	17	11,530	17	11,503	0	-	0	-	5	94
65-69	15	12,266	15	12,151	2	678	0	-	3	123
70-74	14	13,349	14	13,193	2	953	0	-	2	136
75-79	15	12,435	15	12,435	0	-	0	-	0	-
80-84	11	13,462	11	13,462	0	-	0	-	0	-
85-89	7	10,656	7	10,656	0	-	0	-	0	-
90-94	4	19,248	4	19,248	0	-	0	-	0	-
All Ages	157	12,412	146	11,374	48	3,518	1	115,038	31	136

	31 March 2013	31 March 2010
Average age	63.0	59.7
Average age at death of member	54.5	51.6

Appendix 13 - Acknowledgements

The Department of National Defence provided relevant valuation input data on active members, pensioners and survivors. Superannuation Directorate of the Department of Public Works and Government Services Canada provided additional information in respect of pensioners and survivors.

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