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ACTUARIAL REPORT

on the Pension Plan for the CANADIAN FORCES

Reserve Force as at 31 March 2010

Canada

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15 July 2011

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 2010 of the Canadian Forces - Reserve Force pension plan. This plan is defined by Part I.1 of the *Canadian Forces Superannuation Act* and the *Pension Benefits Division 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 - Reserve Force (Reserve Force pension plan) was made pursuant to the *Public Pensions Reporting Act* (PPRA).

This actuarial valuation is as at 31 March 2010 and is in respect of pension benefits and contributions defined by Part I.1 of the *Canadian Forces Superannuation Act* (CFSA) and the *Pension Benefits Division Act* (PBDA).

The date of the next periodic review is scheduled to occur no later than 31 March 2013.

A. Purpose of Actuarial Report

The purpose of this actuarial valuation is to determine the state of the Reserve Force Pension Fund 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

There have been no changes to the plan provisions since the previous valuation. This report is based on pension benefit provisions enacted by legislation, summarized in Appendix 1.

The financial data on which this valuation is based are composed of tangible assets which the government has earmarked for the payment of benefits for service with respect to the Reserve Force pension plan. These pension assets are summarized in Appendix 2. The membership data is summarized in Appendices 3 and 8.

The valuation was prepared using accepted actuarial practices, methods and assumptions which are summarized in Appendices 4, 5 and 6.

Actuarial assumptions used in the previous report were revised based on economic trends and demographic experience. All actuarial assumptions are best-estimate assumptions and are individually reasonable for the purposes of the valuation at the date of this report.

The following table presents a summary of the economic assumptions used in this report compared to those used in the previous report:

Table 1 Ultimate Best-Estimate Economic Assumptions

	31 March 2010	31 March 2008
Assumed level of inflation	2.3%	2.4%
Real increase in average pensionable earnings	1.2%	1.1%
Real rate of return	4.2%	4.3%

C. Main Findings

The proposed amounts to be credited to (or debited from) the Reserve Force Pension Fund are shown on a calendar year basis in this section beginning with calendar year 2012 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) Current Service Cost[2]

The total normal cost, borne jointly by the members and the government, is $67.2 million for calendar year 2012. The estimated members' contributions are $24.8 million and the estimated government contributions are $42.4 million for calendar year 2012. The Reserve Force Pension Fund administrative expenses are $6.0 million (included in the total current service cost) for calendar year 2012. The following table shows the projected current service cost expressed as a percentage of the expected pensionable payroll[3] for the three calendar years following the expected laying of this report. The ratio of government current service cost to the members current service cost is also shown.

Current Service Cost on a Calendar Year Basis

Calendar Year	Current Service Cost As a percentage of pensionable payroll			Ratio of Government to Contributors Current Service Cost
	Contributors	Government	Total	
2012	5.20	8.89	14.09	1.71
2013	5.20	9.13	14.33	1.76
2014	5.20	9.38	14.58	1.80

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

As at 31 March 2010, the actuarial value of the assets in respect of the Reserve Force Pension Fund is $233.3 million and the actuarial liability is $155.7 million, resulting in an actuarial surplus of $77.6 million.

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1 Any reference to a given *plan year* in this report should be taken as the 12-month period ending 31 March of the given year.
2 Also called normal cost.
3 *Pensionable payroll* is defined in Note 1 of Appendix 1-D.

3) Non-permitted actuarial surplus

If there exists in the opinion of the President of the Treasury Board a non-permitted actuarial surplus[1] in the Pension Fund, any future contributions to the Fund may be reduced in a manner determined by the President.

As at 31 March 2010, there exists a non-permitted actuarial surplus of $46 million. On the basis of the assumptions and methodology contained in this report the non-permitted actuarial surplus is projected to be $35 million on 31 March 2012. The exact value of the 31 March 2012 non-permitted surplus will need to be reevaluated so that the decision of the President of TBS, if any, would be based on the most up to date information.

[1] A non-permitted actuarial surplus exists when the amount by which the actuarial value of assets exceeds the liabilities is greater than the lesser of (a) and (b), where:
(a) is 20% of the amount of liabilities, 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.

II. Valuation Results

This report is based on pension benefit provisions enacted by legislation, summarized in Appendix 1, and the financial and membership data, summarized in Appendices 2 and 3. The valuation was prepared using accepted actuarial practices, methods and assumptions summarized in Appendices 4, 5 and 6. Emerging experience, differing from the corresponding assumptions, will result in gains or losses to be revealed in subsequent reports.

The projection of the Reserve Force Pension Fund financial position is shown in Appendix 7.

A. Financial Position

Beginning on 1 March 2007, member and government contributions to the Reserve Force pension plan are credited to the Reserve Force Pension Fund, and the total amount of contributions net of the benefits paid and the administrative expenses is transferred to the PSPIB and invested in the financial markets. The valuation results of this section show the financial position as at 31 March 2010. The results of the previous valuation are also shown for comparison purposes.

Table 2 Balance Sheet - Reserve Force Pension Fund
($ millions)

	31 March 2010	31 March 2008
Actuarial Value of Assets		
Market value of assets	235.3	64.2
Actuarial smoothing adjustment	(8.5)	2.2
Present value of prior service contributions	6.5	-
Total assets	233.3	66.4
Actuarial Liability		
Active contributors	136.7	53.5
Retirement pensioners	18.5	2.2
Surviving dependents	0.5	-
Total actuarial liability	155.7	55.7
Actuarial Surplus/(Deficit)	77.6	10.7

B. CFSA - Reconciliation of the Changes in Financial Position

This section reconciles the changes in the financial position in respect of the Reserve Force Pension Fund shown in this valuation using the main elements responsible for the changes. The items shown are explained afterward.

Table 3 Reconciliation of CFSA Financial position
($ millions)

	Pension Fund Actuarial Surplus/(Deficit)
As at 31 March 2008	10.7
Recognized investment losses as at 31 March 2008	(2.2)
Retroactive changes to the population data	(5.1)
Expected interest on revised initial financial position	0.4
Experience gains and losses	80.8
Revision of actuarial assumptions	(2.3)
Change in the present value of prior service contributions	3.8
Unrecognized investment gains as at 31 March 2010	(8.5)
As at 31 March 2010	77.6

1) Recognized Investment Losses as at 31 March 2008

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 Reserve Force Pension Fund assets to be $2.2 million more than their market value.

2) Retroactive changes to the population data

The net impact of the retroactive changes to the population data received from both the Department of National Defence and the Public Works Government Service Canada (PWGSC) has resulted in an increase of $5.1 million in the Reserve Force Pension Fund actuarial liability.

3) Expected Interest on Initial Financial Position

After recognizing both the retroactive changes to the population data and the recognized investment losses items, the expected interest to 31 March 2010 on the resulting Reserve Force Pension Fund actuarial surplus of $3.4 million as at 31 March 2008 amounted to $0.4 million. The expected interest amount was based on the Fund yields projected in the previous report for the two-year intervaluation period.

4) Experience Gains and Losses

Since the previous valuation, the Reserve Force Pension Fund actuarial surplus has increased by $80.8 million due to the experience gains and losses over the two-year intervaluation period. The main items are described in the Table 4 of page 12.

Table 4 Experience Gains and Losses
($ millions)

	Pension Fund
Demographic experience (i)	
Disability Retirements	(0.3)
Non-disabled pensioner deaths	(0.1)
Retirements	0.7
Terminations with a return of contributions or a transfer value	6.1
New members	(5.5)
Terminations with an annuity	(2.6)
Deaths with an annuity	(0.4)
Total	(2.1)
Investment earnings (ii)	(11.7)
Cost/contributions difference (iii)	85.0
Earnings increases (iv)	(0.7)
Expected/actual disbursements (v)	11.0
Administrative expenses (vi)	(0.6)
Miscellaneous	(0.1)
Experience Gains and Losses	80.8

(i) The net impact of the demographic experience increased the Fund actuarial liability by $2.1 million. The demographic assumptions having a large impact are as follows:

- During the two-year intervaluation the number of new members to the plan was more that anticipated resulting in an increase of $5.5 million in Fund actuarial liability.
- Higher than expected terminations with a return of contributions or the commuted value of pension resulted in a decrease of $6.1 million in the Fund actuarial liability.
- Higher than expected terminations with a deferred annuity resulted in an increase of $2.6 million in the Fund actuarial liability.

(ii) The global economy and financial markets took a turn for the worst during plan year 2009, showing a -23% return, and even though the markets rebounded during plan 2010 with a return of 22%, the Reserve Force Pension Fund experienced an investment loss of $11.7 million over the two-year intervaluation period.

(iii) An increase of $85.0 million to the Fund actuarial surplus resulted from the actual members and government contributions in plan year 2009 and 2010 being more than projected. The 31 March 2007 cost estimate report, performed to support both the implementation of the Reserve Force pension plan and the 2007 Public Accounts, made the assumption that most members would buyback their service and that all members pensionable service would count towards benefit eligibility. The direct results of this assumption was to set the current service cost for the starting years of the pension plan to its expected long term service cost, estimated at the time to be at around 16.5% of pensionable payroll .

With an update of the membership information as at 31 March 2008, the 2008 Actuarial Report on the pension plan for the Reserve force showed a significant decrease in the current service cost which reflected the actual pensionable service to the credit of members. The 2008 Actuarial report was sent to the President of Treasury Board Secretariat in November 2009; hence the pension plan received contributions at an average current service cost of 16.5% of pensionable payroll during plan year 2009 and 2010 instead of the average service cost of 14% of pensionable payroll as stated in the 2008 Actuarial report.

In addition, the Government contributions for the prior service elections were set at 2.7 times members' contributions, that is, similar to the Regular Force government to member contribution ratio. The 2008 Reserve Force Actuarial Report estimated that the Government contribution ratio at one time members contributions. The excess contributions rate for prior service elections and current service cost are the two main reasons for the increase of $85.0 million to the Fund actuarial surplus.

(iv) The experience of the last two years has shown that the earnings increases were marginally higher than expected in the previous report. This resulted in an increase of $0.7 million in the Fund actuarial liability.

(v) An increase of $11.0 million in the Fund actuarial surplus resulted mainly from lower than anticipated transfer value payments and returns of contributions to terminating members.

(vi) Administration expenses over the intervaluation period were $0.6 million more than anticipated.

5) Revision of Actuarial Assumptions

Actuarial assumptions were revised based on economic trends and demographic experience as described in Appendices 5 and 6. This revision has decreased the Reserve Force Pension Fund actuarial surplus by $2.3 million. The impact of these revisions is described in the following table.

Table 5 Revision of Actuarial Assumptions
($ millions)

Assumption	Pension Fund
Indexation, Earnings , Short Term Economic Assumptions	(0.5)
Survivors mortality rates	0.9
Longevity improvement factors	(1.0)
Pensioner mortality rates	(0.4)
Proportion married at death	0.1
Withdrawals	(1.3)
Contributors mortality rates	(0.1)
Net impact of revision	(2.3)

As described in Appendix 5 the other economic assumptions made in the previous valuation were revised as follows:

- ultimate level of inflation lowered from 2.4% to 2.3%;
- ultimate real increase in average earnings increased from 1.1% to 1.2%; and
- ultimate real rate of return lowered from 4.3% to 4.2%.

6) Change in the Present Value of Prior Service Contributions

The expected total government cost is shown in Table 11 of page 18. The government is expected to make additional contributions in excess of the current service cost for members expected prior service election. The change in the present value of prior service contributions correspond to members elections since the last report where the members opted to pay for these elections by instalments. Member’s prior service elections paid through instalments have the effect of increasing the Fund assets by $3.8 million.

7) Unrecognized Investment Gains

The same actuarial asset valuation method described in the 2008 valuation report, which role is to minimize the impact of short-term fluctuations in the market value of assets (see Appendix 4) was used for this valuation. For this valuation, the method caused the actuarial value of the Pension Fund assets to be $8.5 million less than their market value due to unrecognized investment gains.

C. Cost Certificate

1) Current Service Cost

The details of the current service cost for plan year 2011 and reconciliation with the plan year 2009 current service costs are shown in the following tables.

Table 6 Current Service Cost for Plan Year 2011
($ millions)

Member required contributions	22.1
Government current service cost	35.9
Total current service cost	58.0
Expected pensionable payroll	424.8
Total current service cost as % of expected pensionable payroll	13.64%

Table 7 Reconciliation of CFSA Current Service Cost
(Percentage of pensionable payroll)

For plan year 2009	13.87
Change in demographics	0.55
Expected current service cost change	0.14
Methodology changes	(1.29)
Changes in assumptions	
Indexation, Earnings , Short Term Economic Assumptions	0.05
Seniority and promotional salary increases	0.02
Withdrawals	0.25
Mortality improvement factors	0.08
Pensioners mortality rates	0.03
Proportion married at death	(0.01)
Contributors mortality rates	0.01
Survivors mortality rates	(0.07)
Pensionable retirements	0.01
For plan year 2011	13.64

2) Projection of Current Service Costs

The current service cost is borne jointly by the members and the government. The member contribution rate on pensionable earnings is 5.2% at the valuation date and there are no scheduled changes to this rate.

Current service costs, expressed in dollar amount as well as in percentage of the projected pensionable payroll, are shown on a plan year basis in Table 8. The member contributions and the government current service costs are also shown on a calendar year basis in the Executive Summary.

Table 8 Projection of Current Service Cost

Plan Year	Current Service Cost ($ millions)			Current Service Cost as a Percentage of Pensionable Payroll			Portion Borne by the Government
	Members	Government	Total	Members	Government	Total	
2011	22.1	35.9	58.0	5.20	8.44	13.64	62%
2012	23.7	39.6	63.3	5.20	8.71	13.92	63%
2013	25.2	43.3	68.5	5.20	8.95	14.16	63%
2014	26.7	47.1	73.8	5.20	9.18	14.38	64%
2015	28.2	51.2	79.4	5.20	9.44	14.64	64%
2020	36.7	75.7	112.4	5.20	10.71	15.91	67%

Until the pension plan reaches its maturity the current service cost as a percentage of pensionable payroll is expected to increase. Since the member contribution rate is set at a maximum of 5.2% of pensionable payroll the government is expected to absorb the future increase in the current service cost.

3) Administrative Expenses

Based upon the assumptions described in Appendix 6H.4, the Fund administrative expenses are included in the total current service costs and are estimated to be as follows:

Plan Year	($ millions)
2011	5.3
2012	5.7
2013	6.0
2014	6.4

4) Contributions for Prior Service Elections

Based upon the valuation data, the assumptions described in sections B and C of Appendix 5 and recent statistical information provided by the Department of National Defence (described below), members and government contributions for prior service elections were estimated as follows:

Table 9 Estimated Contributions for Prior Service
($ millions)

Plan Year	Member	Government
2011	18.6	18.6
2012	27.8	27.8
2013	44.3	44.3
2014	64.4	64.4
2015	88.9	88.9

For the next five years, the bulk of the elections for prior service is expected to be with respect to service prior to March 2007. Part I.1 of the Act is providing the possibility to certain members of the Reserve Force pension plan to elect for service prior to the inception of the pension plan.

For the next five years, members and government contributions were determined on the basis of prior service election information provided by Department of National Defence (DND). The previous report assumed that a total of 5,500 elections would have been received by the end of March 2010. The latest information from DND shows a total of 10,062 elections received by the end of October 2010. According to DND a total of 12,255 elections are expected by the end of plan year 2014. Most of these elections have not yet been processed and DND expects that the 12,255 elections will be processed by the end of plan year 2015.

Using the information provided by DND, it is assumed that approximately 83% of the 12,255 elections would be by members contributing to the Reserve Force pension plan. Table 9 shows the expected contributions of the 10,172 members under the Reserve Force pension plan over the next five plan years.

D. Sensitivity to Variations in Key Assumptions

The following table measures the effect on the plan year 2011 current service cost and liabilities, if key economic assumptions are varied by one percentage point per annum from plan year 2011 onward.

Table 10 Sensitivity of Valuation Results

	Current Service Cost (%)		Actuarial Liability ($ millions)	
Assumption(s) Varied	2011	Effect	2011	Effect
None (i.e. current basis)	13.64	None	155.7	None
Investment yield				
- if 1% higher	10.90	(2.74)	123.8	(31.9)
- if 1% lower	17.63	3.99	201.2	45.5
Inflation				
- if 1% higher	16.03	2.39	184.5	28.8
- if 1% lower	11.85	(1.80)	133.8	(21.9)
Salary, YMPE and MPE				
- if 1% higher	15.86	2.22	177.3	21.6
- if 1% lower	11.87	(1.77)	138.2	(17.5)
All economic assumptions				
- if 1% higher	13.50	(0.14)	153.5	(2.2)
- if 1% lower	13.78	0.14	158.0	2.3

The foregoing estimates indicate the degree to which the Reserve Force valuation results depend on some of the key assumptions. 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.

E. Summary of Estimated Government Costs

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

Table 11 Estimated Government Cost
($ millions)

Plan Year	Current Service Cost	Total Prior Service Contributions	Total Government Cost
2011	36	19	54
2012	40	28	67
2013	43	44	88
2014	47	64	111
2015	51	89	140

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 determining the financial status as at 31 March 2010 of the Reserve Force Pension Fund and assisting the President of the Treasury Board in making informed decisions regarding the financing of the government's pension benefit obligation;
- the methodology employed is appropriate for the purposes of determining the financial status as at 31 March 2010 of the Reserve Force Pension Fund and assisting the President of the Treasury Board in making informed decisions regarding the financing of the government's pension benefit obligation; 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 – Specific Standards for Pension Plans) published by the Canadian Institute of Actuaries.

To the best of our knowledge, after inquiring 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; also the Act does not define the benefits payable upon wind-up. Therefore, a solvency valuation has not been performed.

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Senior Actuary

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

Ottawa, Canada
15 July 2011

Appendix 1 - Summary of Pension Benefit Provisions

The enactment of Bill C-78 on 14 September 1999 gave authority to create a Reserve Force Pension Plan. This Plan was established on 1 March 2007 and provides coverage to part-time members of the Reserve Force who meet the threshold requirements for becoming Plan members. The benefit eligibility rules under the new Plan are the same as the rules that apply to Regular Force members starting on 1 March 2007.

One major aspect of the change to the CFSA was the introduction of the duality in qualifying for benefits as well as an extended definition of pensionable service. Canadian Forces members accumulate two types of service, "pensionable" and "qualifying". The term "pensionable service" takes its usual form, that is, a period of service becomes pensionable to the extent that the member was eligible to contribute to the pension plan and that he/she made the required contributions. The term "qualifying service" refers to period of paid service and/or enrolment periods with pay in the Canadian Forces. Even though very limited, certain types of service in the Canadian Forces are excluded. Regardless of event leading to a benefit entitlements (withdrawal, retirement, disability or death) or the basis on which the member qualifies (pensionable or qualifying) the benefit to be received under Part I.1 is based on career average pensionable earnings.

The duality in qualifying for benefits depends on the types of service, "pensionable" versus "qualifying". To qualify for the early retirement benefit (after 25 years of service under the new terms of service) the qualifying service is used. Under the new entitlement provisions, an annual allowance will be available from age 50 with the completion of two years of pensionable service. A member terminating with at least two years of pensionable service will be entitled to a full immediate annuity at the age of 55 with a minimum of 30 years of pensionable service or if he/she becomes disabled or reaches the age of 60.

Valuation Methodology

This valuation is based on the use of the pensionable service years credited to each member as at 31 March 2010 to estimate future benefit entitlements. However, this valuation also recognizes that certain members will be entitled to an unreduced benefit at an earlier age after the completion of a total of 25 years of qualifying service.

Summary of Pension Benefit Provisions

Summarized in this Appendix are the pension benefits provided under Part I.1 of the CFSA registered provisions which are in compliance with the *Income Tax Act*.

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

A. Membership

A member of the Reserve Force is deemed to become a member in the Reserve Force pension plan, defined under Part I.1 of the CFSA, if,

a) on 1 March 2007, during each of any two consecutive periods of 12 months beginning on or after 1 April 1999 and ending no later than 1 March 2007, the earnings that they were entitled to receive were equal to or greater than 10 per cent of the Annual Earnings

Threshold[1], if the member already was or became a member of the Canadian Forces during the first month of the first period and remained a member of the Canadian Forces, without any interruption of more than 60 days, until 1 March 2007; or

b) in any other case, on the first day of the month following two consecutive periods of 12 months — the second of which shall end after 1 March 2007 — during each of which the earnings that they were entitled to receive were equal to or greater than 10 per cent of the Annual Earnings Threshold, if the member already was or became a member of the Canadian Forces during the first month of the first period and remained a member of the Canadian Forces without any interruption of more than 60 days throughout those two periods.

B. Contributions

1. Members

During the first 35 years of pensionable service, members contribute 5.2% on all earnings up to 2/3 of the Maximum Pensionable Earnings (MPE) as defined under the Income Tax Regulations. After 35 years of pensionable service, members contribute only 1% of pensionable earnings.

2. Government

a) Current Service

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

b) Elected Prior Service

Consistent with the previous valuation, this valuation assumes that the government will match member contributions for prior service elections.

c) Actuarial Surplus

The Regulations under Part I.1 of the Act gives the government the authority to deal with any actuarial surplus, subject to limitations, in the Pension Fund as they occur by reducing employer contributions.

d) Actuarial Deficit

If an actuarial deficit is identified through a triennial statutory actuarial report, the Pension Fund is to be credited with such annual amounts that in the opinion of the President of the Treasury Board will fully amortize the actuarial deficit over a period not exceeding 15 years.

[1] Annual Earnings Threshold is equal to the sum of 1/12 of the Year's Maximum Pensionable earnings over any 12 months period.

C. Summary Description of Benefits

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

The rate of retirement pension is equal to 1.5% of the greater of the member's total pensionable earnings and total updated pensionable earnings over the most recent 35 years of pensionable service (i.e. Updated Career Average Plan). The plan also provides a bridge benefit equal to 0.5% of the greater of the pensioner's total bridge benefit earnings and total updated bridge benefit earnings over the most recent 35 years of pensionable earnings. The pension and bridge benefits are indexed annually with the Consumer Price Index and the accumulated indexation may be payable at the earliest of age 55 as defined in Note 6 of section D below.

Entitlement to benefits depends on either qualifying service in Canadian Forces or pensionable service, as defined in Notes 7 and 8 of section D below.

Detailed notes on the following overview are provided in the following section.

1. Benefit Entitlement on the basis of "Pensionable "Service

Member's Type of Termination	Benefit
With less than two years of pensionable service	Return of contributions
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 10 years of service or more	
▪ Leaving prior to age 50, except for death, and	
- Because of disability	Immediate annuity
- Otherwise	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

2. Benefit Entitlement on the basis of "Qualifying" Service

Member's Type of Termination	Benefit
Retirement on completion of 25 years or more of Canadian Forces service *(Note* 7)	Immediate annuity *(Note 10*)

D. Explanatory Notes

1. Earnings

Earnings mean the salary at the annual rate prescribed by the regulations made pursuant to the *National Defence Act* together with premiums in lieu of leave.

Pensionable earnings mean the earnings of a member, with less than 35 years of pensionable service, having completed the required two-year waiting period.

Pensionable payroll means the aggregate pensionable earnings of all members.

2. Wage measure

Wage measure is

(a) for a calendar year prior to 2012, the corresponding rate of pay shown in Table 33 of this report ; and

(b) for a calendar year after 2007, the greater of

  a. the standard basic rate of pay for a period of duty or training of six hours or more, before any retroactive adjustment, that was prescribed or established under the *National Defence Act* to be paid, on October 1 of the preceding year, to a member at the rank of Corporal (class A), and

  b. the wage measure of the previous year.

3. Updated Pensionable Earnings

The updated pensionable earnings, for a calendar year, are the member's pensionable earnings, subject to the *Income Tax Act* limits, for that year times A/B, rounded to the nearest fourth decimal place, where

A = the average of the wage measures for five years consisting of the year the member most recently ceased to be a member and the most recent years during which the member was a member and, if necessary, the years preceding all of those years, and

B = the wage measure for that calendar year.

4. Bridge Benefit Earnings

Bridge benefit earnings for a calendar year are the lesser of

(a) the member's pensionable earnings for that year, and

(b) the Yearly Maximum Pensionable Earnings (YMPE) for that year.

5. Updated Bridge Benefit Earnings

Updated bridge benefit earnings for a calendar year are the lesser of

(a) the member's updated pensionable earnings for that year, and

(b) the average of the YMPE for five years consisting of the year the member most recently ceased to be a member and the preceding four years.

6. 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 participation in the plan terminates. The first annual adjustment following termination of employment is prorated accordingly.

c) Commencement of Indexation Payments

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

7. Qualifying Service in the Canadian Forces

For most purposes of the CFSA, qualifying service in the Canadian Forces means service for which a Reserve Force member is paid, and includes:

- days of service in the Regular Force for which pay was authorized, and authorized maternity and parental leaves
    - excluding any service for which a member was paid a return of contributions or lump sum payment under the CFSA that he or she did not elect to repay on subsequent enrolment;
- days of service in the Reserve Force for which pay was authorized, and authorized maternity and parental leaves:
    - 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.

8. Pensionable Service

Pensionable service includes any period of service in the Reserve Force in respect of which a member either made contributions that remain in the Pension Fund or elected to contribute. It also includes any period of prior service for which a 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 they elected to count as pensionable service.

9. 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 Fund together with interest. Interest is calculated at the quarterly Fund rate each quarter on the accumulated contributions with interest as at the end of the previous quarter.

10. Immediate Annuity

Immediate annuity means an unreduced pension that becomes payable immediately upon a pensionable retirement or a pensionable disability. The annual amount is equal to 1.5% of the greater of the member's total pensionable earnings and total updated pensionable earnings over the most recent 35 years of pensionable service, plus an additional bridge benefit equals to 0.5% of the greater of the member's total bridge benefit earnings and total updated bridge benefit earnings.

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 16) or a minimum death benefit (Note 17) may be payable.

11. Deferred Annuity

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

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.

12. Transfer Value

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.

13. Annual Allowance for Member

Annual allowance means an annuity payable immediately on retirement or upon attaining age 50, if later. The amount of the allowance is equal to the amount of the deferred annuity to which the member would otherwise be entitled, reduced by 5% of such annuity multiplied by the difference between 60 and the age when the allowance becomes payable.

However, if the member is at least 50 years old at termination, and has at least 25 years of pensionable service, then the difference is reduced (subject to the above as a maximum) to the greater of

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

When a member in receipt of an annual allowance becomes disabled before reaching age 60, the annual allowance becomes an immediate annuity adjusted in accordance with regulations to take into account the amount of any annual allowance received prior to becoming disabled.

14. Eligible Surviving Spouse or Common-law Partner

Eligible surviving spouse means the surviving spouse or common-law partner of a member or pensioner except if:

(a) the 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 partnership at age 60 or over, unless after such marriage or partnership the pensioner either:

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

15. Eligible Surviving Children

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

16. Annual Allowance for Eligible Survivors

Annual allowance means, for the eligible surviving spouse or common-law partner and children of a member or pensioner, an annuity that becomes payable immediately upon the death of that individual. The annual allowance is equal to

(a) An amount equal to one per cent of the greater of the pensioner's total pensionable earnings and total updated pensionable earnings; or,

(b) If the member was in receipt of an annual allowance at the time of death, an amount equal to A × B / C where:

- A = the amount calculated under paragraph (a),
- B = the amount of the annual allowance, and
- C = the amount of the deferred annuity to which the pensioner was entitled.

(c) Each child of a member who, at the date of the member's death, is under 18 years of age or is 18 or more years of age but less than 25 years of age and enrolled in and pursuing a full-time course of study is entitled

- if the member died leaving a survivor entitled to an allowance equal to 1/4 of the basic allowance or, if there are more than two children, to an annual allowance equal to 1/2 of the basic allowance divided by the number of children; or
- if the member died without leaving a survivor entitled to receive an allowance, and
  - there are fewer than four children, to an annual allowance equal to 1/2 of the basic allowance, or
  - there are more than three children, to an annual allowance equal to 1.5 times the basic allowance divided by the number of children.
- The proportion of the basic allowance that constitutes the annual allowance shall be revised when the number of children who are entitled changes.

17. Minimum Death Benefit

If upon the death of a 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 member or to the named beneficiary under CFSA Part II, if any exist, an amount equal to A minus B where;

A. is the greater of a return of contributions and an amount equal to five times the total of the initial annuity plus the bridge benefit (see Notes 9 and 10 above); and
B. is the aggregate of all amounts paid to a survivor or child and to the member or pensioner.

18. 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 Fund to the credit of a member or pensioner. As at the transfer date, the maximum transferable amount is half the value of the retirement pension accrued by the 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 member or pensioner are then reduced accordingly.

Appendix 2 - Assets and Rates of Return

A. Assets

The pension promise to members of the Canadian Forces - Reserve Force enacted by legislation encompasses government assets and liabilities. The assets the government uses to finance the pension promise are composed of the tangible assets of the Reserve Force Pension Fund which the government has earmarked for the payment of benefits.

1. Reserve Force Pension Fund

Since 1 March 2007, contributions (for current and prior service) have been credited to the Reserve Force Pension Fund. The Fund is invested in the financial markets with a view to achieving maximum rates of return without undue risk.

The Fund has been credited with all contributions as well as with the net investment earnings generated by the capital assets managed by the PSPIB. It is debited with benefit payments and plan administrative expenses.

Table 12 Reconciliation of Balances in Pension Fund
($ millions)

Plan Year	2009	2010	2009-2010
Opening balance	64.2	121.3	64.2
INCOME			
Interest earnings	(25.2)	31.9	6.7
Employer contributions	64.3	67.6	132.0
Member contributions	23.8	28.0	51.8
Transfers received	-	-	-
Actuarial liability adjustments	-	-	-
Subtotal	*62.9*	*127.5*	*190.4*
EXPENDITURES			
Annuities	0.2	1.0	1.2
Pension divisions	-	-	-
Return of contributions	-	0.2	0.2
Pension transfer value payments	0.9	6.7	7.6
Transfers to other pension plans	-	-	-
Minimum benefits	-	-	-
Administrative expenses	4.6	5.6	10.3
Subtotal	*5.8*	*13.5*	*19.3*
Closing balance	121.3	235.3	235.3

Since the last valuation, the Fund balance has increased by $171.1 million (a 267% increase) to reach $235.3 million as at 31 March 2010.

B. Rates of Return

The Fund yields are those from the PSPIB 2010 Annual Report.

Plan Year	Pension Fund
2009	(22.7%)
2010	21.5%

C. Sources of Asset Data

The Reserve Force 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 3 - Membership Data

A. Sources of Membership Data

The valuation input data required in respect of members, former members (pensioners) and survivors are provided by the Department of National Defence (DND). Because DND does not administer the pension payments made to members of the Canadian Forces - Reserve Force, the information received from DND on former members may not be accurate since the information is not kept up to date. It is for this reason that an additional set of valuation data on former members of the Canadian Forces - Reserve Force is extracted from master computer files maintained by the Superannuation Directorate of the Department of Public Works and Government Services Canada. This second set of valuation data on former members permits cross verification of two sources.

The main valuation data file supplied by DND contained the historical status information on all members up to 31 March 2010. The valuation data file on former members of the Canadian Forces - Reserve Force provided by PWGSC covers the period of 1 March 2007 to 31 March 2010.

B. Validation of Membership Data

1. Status-Related Tests

The following status tests were made 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: member, outstanding termination, pensioner, deceased leaving an eligible survivor; and,
- if a member or pensioner record indicated that the member died leaving an eligible survivor, then a corresponding survivor record should exist.

2. Benefit-Related Tests

Consistency tests were made to ensure that all proper information to value the member benefits based on individual statuses as at 31 March 2010 was included, by verifying that

a) For Active Members

- the earnings were included and, if not, imputing earnings by updating earnings from a previous year with an average earnings increase or failing that, using the average earnings for that sex.

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 2010.

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 several 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 8.

Table 13 Reconciliation of Contributors

	Male			Female			
	Officer	Other Rank	Total	Officer	Other Rank	Total	Total
As at 31 March 2008	**4,831**	**10,911**	**15,742**	**2,100**	**2,614**	**4,714**	**20,456**
Data corrections	64	(32)	32	31	(27)	4	36
New entrants	876	4,029	4,905	495	786	1,281	6,186
Changes of							
Officers/Other Ranks	16	(16)	-	-	-	-	-
Service Type	(336)	(1,273)	(1,609)	(111)	(332)	(443)	(2,052)
Subtotal	(320)	(1,289)	(1,609)	(111)	(332)	(443)	(2,052)
Lump sum terminations							
Return of contribution	(408)	(1,194)	(1,602)	(207)	(237)	(444)	(2,046)
Transfer value	(3)	(5)	(8)	-	-	-	(8)
Subtotal	(411)	(1,199)	(1,610)	(207)	(237)	(444)	(2,054)
Pensionable terminations							
Disability	(3)	(3)	(6)	-	-	-	(6)
Death	(10)	(20)	(30)	(1)	(1)	(2)	(32)
Retirement	(204)	(433)	(637)	(90)	(130)	(220)	(857)
Subtotal	(217)	(456)	(673)	(91)	(131)	(222)	(895)
As at 31 March 2010	**4,823**	**11,964**	**16,787**	**2,217**	**2,673**	**(222)**	**21,677**

Table 14 Reconciliation of Pensioners

	Male			Female			
	Officer	Other Rank	Total	Officer	Other Rank	Total	Total
Retirement Pensioners							
As at 31 March 2008	11	-	11	2	-	2	13
Data corrections	9	6	15	1	3	4	19
New pensioners	204	433	637	90	130	220	857
Terminations							
Rehired	(20)	(36)	(56)	(15)	(2)	(17)	(73)
As at 31 March 2010	204	403	607	78	131	209	816
Disability Pensioners							
As at 31 March 2008	1	-	1	-	-	-	1
Data corrections	1	-	1	-	-	-	1
New pensioners	3	3	6	-	-	-	6
As at 31 March 2010	5	3	8	-	-	-	8

Table 15 Reconciliation of Spouse Survivors

	Widows	Widowers	Total
As at 31 March 2008	-	-	-
Data corrections	-	-	-
New from contributors	5	-	5
As at 31 March 2010	5	-	5

Table 16 Reconciliation of Survivors - Children/Students

	Children	Students	Total
As at 31 March 2008	-	-	-
Data corrections	-	-	-
New from contributors	8	-	8
As at 31 March 2010	8	-	8

Appendix 4 - Valuation Methodology

A. Reserve Force 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 is spread over five years, subject to a 10% corridor. 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 Fund-related amount available for benefits 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 was calculated using the assumed yield on the Pension Fund.

The actuarial value of the assets, determined as at 31 March 2010, under the adjusted market value method is $233.3 million and was determined as follows:

Table 17 Actuarial Value of Pension Fund Assets
($ millions)

Plan Year	2006	2007	2008	2009	2010	
Actual net investment return (A)	-	-	(0.7)	(25.3)	31.5	
Expected investment return (B)	-	0.1	2.1	6.3	9.7	
Investment gains (losses) (A-B)	-	(0.1)	(2.8)	(31.6)	21.8	
Gains (losses) recognized immediately	-	-	-	(18.6)	-	
Investment gains (losses) to be amortized	-	(0.1)	(2.8)	(13.0)	21.8	
Unrecognized percentage	0%	20%	40%	60%	80%	
Unrecognized investment gains (losses)	-	-	(1.1)	(7.8)	17.4	
Market value as at 31 March 2010						235.3
Plus						
Present value of prior service contributions						6.5
Less						
Total unrecognized investment gains						8.5
Actuarial value as at 31 March 2010						233.3

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

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 valuations, 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 in the year preceding the valuation date 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* were taken into account to determine the benefits payable under Part I.1 of the CFSA.

1. Current Service Costs

Under the projected accrued benefit actuarial cost method, the current service cost, also called 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 pensionable payroll, can be expected to remain stable as long as the average age and service of the total population remains constant.

As at the valuation date, the Reserve Force pension plan has been in operation for a total of 37 months. With the recognition of current and prior pensionable service election made by members as at 31 March 2010 the average age and pensionable service are respectively 31.6 and 2.3 years. Being a young pension plan, the Reserve Force pension plan current service cost is expected to increase over the years. In addition, the pension plan's own experience is limited and projecting when the current service cost for the total population will become stable is unknown at this time. With three more years of experience, the next valuation report will provide an indication of when the projected long term current service cost is expected to stabilize to the extent that all prior service elections will have been processed by the DND.

The government current service cost is the total current service cost reduced by the members' contributions.

2. Actuarial Liability

The actuarial liability with respect to members corresponds to the value, discounted in accordance with the actuarial assumptions, of all future payable benefits accrued as at the valuation date in respect of all previous service. For pensioners and survivors, the

[1] As defined in Appendix 6H.4 Administrative Expenses

actuarial liability corresponds to the value, discounted in accordance with the actuarial assumptions, of future payable benefits.

3. **Unreduced Retirement Benefit on Account of Total Canadian Forces Service**

This valuation recognizes the higher cost and liabilities associated with members that would qualify, as at 31 March 2010, for an early unreduced retirement benefit due to their completion of a total of 25 years of Canadian Forces (both Regular and Reserve) service.

4. **Actuarial Surplus (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 surplus or deficit is the difference between the actuarial value of assets and the actuarial liability. A new actuarial deficit may be amortized over a period not exceeding 15 years through special payments and the disposition of any actuarial surplus is defined in Part I.1 of the CFSA.

5. **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

The projected yields (shown in Appendix 5) assumed for computing future interest earnings credited to the Reserve Force Pension Fund were developed on the basis that the Fund holds a diversified mix of assets.

The interest discount rate used in the determination of the actuarial liability and the current service is set equal to the expected future interest earnings on Plan assets.

D. Membership Data

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

The member data shown in Appendices 3 and 8 were provided as at 31 March 2010. 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 2010. Future member contributions in respect of elected prior service took into account only the payment streams that were still in effect at 31 March 2010. Only payments due after 31 March 2010 were included.

Appendix 5 - 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 obligations 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 judgment of the future long-term experience of the Plan and do not include a margin.

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 2006, the Bank of Canada and the Government renewed their commitment to keep inflation between 1% and 3% until the end of 2011. It is assumed that this commitment will be renewed for another five years following 2011. Therefore, a price increase rate of 2.0% is assumed for plan years 2011 to 2017. For plan years 2018 to 2020, the CPI is assumed to increase from 2.0% to 2.3% and remain at 2.3% thereafter. The ultimate rate of 2.3% is 0.1% lower than the assumed rate from 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 provides a bridge benefit based on career earnings up to the YMPE. The assumed increase in the YMPE for a given 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 for 2011 was determined to be $48,300. 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 with a relatively high unemployment rate in fiscal year 2011. Thus, a real-wage differential of 0.2% is assumed for 2012, and is assumed to gradually increase to the ultimate assumption of 1.3% by 2021. The ultimate real-wage differential assumption combined with the ultimate price increase assumption results in an assumed annual increase in

[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 4.1% (derived from 1.065/1.023) rather than 4.2%.

nominal wages of 3.6% in 2021 and thereafter. Thus, the ultimate rate of increase for the YMPE is 3.6%, resulting from a 1.3% increase in the real AWE and a 2.3% increase in the CPI.

2. Increase in Average Pensionable Earnings

Average pensionable earnings are applicable to 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 0.1% lower than the corresponding increase in the YMPE. The ultimate increase in average pensionable earnings is 3.5%.

3. Increase in Maximum Pensionable Earnings (MPE)

Since the plan is not coordinated with the Canada Pension Plan, the tax-related maximum pensionable earnings were derived from the maximum annual pension accrual under a registered defined benefit plan. The maximum annual pension accrual of $2,494.44 for 2010 will increase to $2,552.22 for 2011, in accordance with Income Tax Regulations. Thereafter, the maximum annual pension accrual is assumed to increase in accordance with the assumed annual increase in the YMPE, which is the same as the assumed annual increase in the AWE.

The MPE is $170,200 for calendar year 2011. In plan year 2010 there was only one member with earnings above $170,200.

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 real yield on long-term federal bonds is assumed to be 2.1% in plan year 2011, 2.3% in plan year 2012 and 2.5% in plan year 2013. The real yield then increases by 0.1% in each of the next three years to reach its ultimate value of 2.8% in plan year 2016. The real yield on long-term bonds is based on historical yields and is unchanged from the previous report.

2. Rate of Return on the Fund

The annual nominal rates of return on the Fund are required for the computation of present values of benefits to determine the liability and the current service cost. This is consistent with the Canadian Institute of Actuaries' Standards of Practice. The following sections describe how the rates of return on the Fund are determined.

a) Investment Strategy

Tangible assets resulting from transferred amount equal to the government and employee contributions, net of benefit payments, are invested in capital markets through the PSPIB. PSPIB invests funds according to its own investment policies 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 return 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 return assets include such categories as real estate and infrastructure.

As at 31 March 2010, the asset mix for the Plan consisted of 60% equity, 24% fixed income securities (including world inflation-linked bonds) and 16% real return assets. PSPIB has developed a long-term target Policy Portfolio (approved by its Board of Directors on 31 March 2011 and subject to an annual review), which consists of 56% equity, 18% fixed income securities (including world inflation-linked bonds) and 26% real return assets. The Policy Portfolio asset mix weights represent long-term targets. Therefore, the initial asset mix for this Plan is derived using the actual investments reported by PSPIB as at 31 March 2010.

The asset mix of the Plan portfolio at the beginning of plan year 2011 consists of 60% equity, 24% fixed income and 16% real return assets. As PSPIB Policy Portfolio reflects long-term expectations, it is assumed that the asset mix of the Plan portfolio will converge slowly toward the Policy Portfolio, but not necessarily reaching its ultimate weights. Indeed, the ultimate asset mix of the Plan portfolio is reached in plan year 2015 and consists of 60% equity, 20% fixed income securities and 20% real return assets.

Table 18 shows the assumed asset mix for each plan year throughout the projection period.

Table 18 Asset Mix
(in percentage)

Plan Year	Fixed Income Securities	Canadian Equity	U.S. and Foreign Equity	Emerging Market Equity	Real Estate & Infrastructure
2011	24	29	24	7	16
2012	20	28	28	7	17
2013	20	27	28	7	18
2014	20	26	28	7	19
2015	20	25	28	7	20
2016+	20	25	28	7	20

b) Real Rates of Return by Asset Type

Real rates of return are required in order to discount future payable benefits for the determination of Plan liabilities and current service cost. They are assumed for each year of the projection period and for each of the main asset categories in which Plan assets are invested. All of the real rates of return described in this section are net of investment expenses other than operating expenses, that is, net of transaction costs and investment management fees (subsection c) describes how the portfolio returns are further reduced for operating expenses) and include an allowance for rebalancing and diversification. Over the last three plan years, investment expenses other than operating expenses have been, on average, equal to about 0.20% of average net assets. It is assumed that 50 % of those investment expenses (transaction costs and investment management fees) are incurred through active management decisions that are expected to be self supporting. Therefore, it is assumed that going forward transaction costs and investment management fees will represent 0.10% of average net assets.

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. It is assumed that 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.

Fixed Income Securities

PSPIB currently has 24% of the Plan portfolio invested in fixed income securities, including Canadian fixed income, world government bonds, world inflation-linked bonds and cash. PSPIB Policy Portfolio assumes a long-term target weight for fixed income securities of 18% (including world inflation-linked bonds). Thus, it is assumed that the proportion invested in fixed income securities will decrease in order to follow the Policy Portfolio. It is assumed that by plan year 2012, 20% of the portfolio will be invested in fixed income securities. Net cash flows (contributions less expenditures) are expected to become negative during plan year

2042 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.

It is assumed that the Plan's fixed income portfolio consists of federal, provincial, corporate and inflation-linked bonds. Initially, the fixed income portfolio is assumed to consist of 35% federal bonds, 17% provincial bonds, 18% corporate bonds and 30% inflation-linked bonds. However, the bond mix is assumed to shift over the following five plan years as investments in provincial and corporate bonds increase while investments in federal and inflation-linked bonds decrease. The fixed income portfolio is projected to reach its ultimate assumed mix of 30% federal, 30% provincial, 30% corporate and 10% inflation-linked bonds in plan year 2016.

The assumed ultimate real yield on long-term federal bonds is 2.8%. The initial spreads over the federal bond real yield are assumed to be 65 basis points for provincial bonds and 145 basis points for corporate bonds. These spreads are much higher than in the last report and reflect the current economic environment. The ultimate spreads for provincial and corporate bonds are assumed to be 45 basis points and 90 basis points, respectively, and are reached at the end of plan year 2012 and 2015 respectively. Corporate bond spreads are net of the expected default rate. Real return bonds, on the other hand, 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 -50 basis points initially and will reach its ultimate value of -40 basis points at the end of plan year 2012.

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 long-term 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 2010 and 2015 and only stabilize at the end of 2015. Therefore, bond returns are quite low for the first five years of the projection. The assumed ultimate real rate of return for long-term federal bonds is 2.8% starting in plan year 2016. An ultimate real rate of return of 3.2% is assumed for the fixed income portfolio for 2016 and thereafter.

Equity

Most Plan assets are currently 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.

Since the last actuarial valuation, equity returns have been very volatile. In plan year 2009, the Fund earned a nominal return of -23%, but it rebounded with a nominal return of 22% in plan year 2010. The economy is expected to continue to strengthen over the next five years. Thus, equity returns are assumed to be higher over the next five years, before reaching their ultimate value in plan year 2016.

Consistent with the assumption that risk taking must be rewarded, equity returns are developed by adding an equity risk premium to the long-term federal bond real rate of return. Historical equity risk premiums were higher than expected due to several non-repeatable 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. However, the equity risk premium is assumed to be higher in the first five years of the projection (starting at 6.9% in plan year 2011, decreasing to 4.0% in plan year 2015 and to 2.0% for plan year 2016 and thereafter), before reaching its ultimate rate of 2.0% for Canadian and foreign developed markets. The equity risk premium is higher over the first five years for two reasons. First and foremost, long-term federal bond rate of returns are expected to be low over that period. Second, slightly higher equity returns are expected due to the strengthening of the economy; as the economy gets stronger, current risks embedded in the market are expected to fade out gradually. The equity risk premium for emerging market equities is expected to be 1.0% 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 yield and real rate of return are set at 2.8% for plan years 2016 and thereafter.

Real rates of return for developed market equity investments are projected to be 4.8% (5.8% for emerging markets) throughout the projection period.

Real Return Assets

Real return assets such as real estate and infrastructure are considered to be a hybrid of debt and equity. If these assets are considered to behave 40% like debt and 60% like developed market equities, then the assumed return should be composed of 40% of the return on the fixed income portfolio and 60% of the return on developed market equities. Thus, the assumed real return for these assets increases from 3.7% in plan year 2011 to 4.2% in the long term.

Table 19 summarizes the assumed real rates of return by asset type throughout the projection period, net of transaction costs and investment management fees.

Table 19 Real Rate of Return by Asset Type
(in percentage)

Plan Year	Fixed Income Securities	Canadian Equity	U.S. and Foreign Equity	Emerging Market Equity	Real Estate & Infrastructure
2011	-0.1	4.8	4.8	5.8	2.9
2012	0.2	4.8	4.8	5.8	3.0
2013	1.2	4.8	4.8	5.8	3.4
2014	1.8	4.8	4.8	5.8	3.6
2015	2.0	4.8	4.8	5.8	3.7
2016+	3.2	4.8	4.8	5.8	4.2

c) Overall Rate of Return on Fund

The best-estimate rate of return on total assets was 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 reduced to reflect PSPIB operating expenses. Over the last three plan years, operating expenses have been, on average, equal to about 0.20% of average net assets. It is assumed that going forward operating expenses will remain at 0.20% of average net assets. Therefore, the rates of return described in this section are net of all investment expenses (0.30%), that is, 0.10% for transaction costs and investment management fees and 0.20% for operating expenses. The resulting nominal and real rates of return are shown in Table 20.

Table 20 Rates of Return on Assets in Respect of the Pension Fund
(in percentage)

Plan Year	Nominal	Real
2011	6.2	4.2
2012	6.2	4.2
2013	6.2	4.2
2014	6.2	4.2
2015	6.2	4.2
2016	6.2	4.2
2017	6.3	4.2
2018	6.4	4.2
2019	6.5	4.2
2020+	6.5	4.2

For Plan assets, it is assumed that the ultimate real rate of return on investments will be 4.2%, net of all investment expenses. This represents a reduction of 0.1% from the previous valuation. The real rate of return on PSPIB assets takes into account the assumed asset mix of investments as well as the assumed real rate of return for all categories of PSPIB assets. The nominal returns projected for the Fund are simply the sum of the assumed level of inflation and the real return on the Fund.

3. Transfer Value Real Interest Rate

The Canadian Institute of Actuaries has adopted the Revised Standards of Practice for Pension Commuted Values, effective 1 April 2009. The financial impact of the Revised Standards has been reflected in this valuation. 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: $r_L + 0.5 \text{ x } (r_L - r_7) + 0.90\%$

Where $r_7 = r_L \text{ x } (i_7/i_L)$

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 2011, the real rates of interest are 2.8% for the first 10 years and 3.0% thereafter. These rates were derived from the assumed 2011 CPI increase and the assumed 2011 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.

4. Summary of Economic Assumptions

The following table summarizes the main economic assumptions over the projection period.

Table 21 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 Return on Fund
2011	2.0	**1.4**	**2.3**	**1.5**	**2.3**	4.1	6.2
2012	2.0	2.0	2.2	2.1	2.2	4.3	6.2
2013	2.0	2.0	2.5	2.4	2.5	4.5	6.2
2014	2.0	2.0	2.7	2.6	2.7	4.6	6.2
2015	2.0	2.0	2.8	2.7	2.8	4.7	6.2
2016	2.0	2.0	2.9	2.8	2.9	4.8	6.2
2017	2.0	2.0	3.0	2.9	3.0	4.8	6.2
2018	2.1	2.1	3.1	3.0	3.1	4.9	6.3
2019	2.2	2.2	3.3	3.2	3.3	5.0	6.4
2020	2.3	2.3	3.5	3.4	3.5	5.1	6.5
2025	2.3	2.3	3.6	3.5	3.6	5.1	6.5
2030	2.3	2.3	3.6	3.5	3.6	5.1	6.5
2035	2.3	2.3	3.6	3.5	3.6	5.1	6.5
2040+	2.3	2.3	3.6	3.5	3.6	5.1	6.5

For the period ending December 2009, the following table was prepared based on the Canadian Institute of Actuaries Report on Canadian Economic Statistics 1924-2009.

Period of Years Ending 2009	15	25	50
Level of Inflation	1.92%	2.53%	4.09%
Real Increases in Average Earnings	0.37%	0.25%	0.99%
Real Return on Long-Term Canada Bonds	6.97%	7.39%	3.72%
Average Real Return on Diversified Portfolios	5.99%	6.40%	4.34%

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 2011 Maximum Pensionable Earnings is $170,200

Appendix 6 - Demographic Assumptions

The Reserve Force pension plan is a young plan, with little experience, providing little predictable information for establishing appropriate demographic assumptions. Except where otherwise noted, the experience of the Regular Force members covered under Part I of the CFSA was deemed to be the best source of data to determine the demographic assumptions.

A. Seniority and Promotional Increases

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

Developing the promotional and seniority increases assumption under the Reserve Force pension plan is difficult since the part-time nature of the Force means that member's year-to-year earnings will fluctuate based on the number of days worked. Since both Forces are hierarchical organizations with similar ranks and structures, it is appropriate to derive the seniority and promotional increase assumption indirectly by using experience data from the Regular Force.

Therefore, as in the previous valuation, the seniority and promotional assumption was determined by studying the experience for the Regular Force by age. The assumed rate increased by an average of 36% for officers under age 36 and increased by an average of 9% for officers over age 36. The assumed rate increased by an average of 6% for other ranks under age 36 and increased by an average of 5% for other ranks over age 36.

The following table provides sample rates seniority and promotional increase.

Table 22 Sample of Assumed Seniority and Promotional Salary Increases
(Percentage of annual earnings)

Age Last Birthday	Officer	Other Rank
17	2.1	17.3
18	2.1	17.3
19	1.9	17.3
20	3.8	14.3
21	46.3	11.8
22	45.1	9.7
23	8.4	8.0
24	6.7	6.6
25	6.3	5.5
26	5.3	4.6
30	3.6	2.5
40	1.4	1.3
50	0.8	0.9

B. New Members

It was assumed that the distribution of new members by age and sex would be the same as that of members with less than one year of service at the valuation date. The total Reserve Force membership under Part I.1 of the CFSA was assumed to remain at the 31 March 2010 level.

The initial earnings of new male and female members in a given age range in plan year 2011 were assumed to be the same as the corresponding experience in plan year 2010 with an economic salary increase for plan year 2011. The initial earnings were assumed to increase in future years in accordance with the assumption for average earnings increases.

C. Pensionable Retirement

As previously described, members of the Forces (Regular and Reserve) may qualify for retirement using either their total qualifying Canadian Forces service or the pensionable service to their credit. As at 31 March 2010, the demographic profile of the Reserve Force membership indicates that the majority of members will be qualifying for a retirement benefit based on their pensionable service.

In the previous valuation report it was assumed that the retirement assumption set in the report on the Pension Plan for the Public Service of Canada as at 31 March 2008, which has been derived on the basis of age and service, was, in the absence of any other reliable information, the best proxy for the retirement assumption of the Reserve Force pension plan, since:

- The majority of Reserve Force members would qualify for benefits that are, by definition, similar to those provided under the Public Service pension plan (PSPP);
- There are similarities between Reserve Force and Public Service members, at comparable age and service, in respect of the incentives to retire that are, to a certain extent, dependent on the financial situation which is, especially for older new employees, directly related to the accumulated level of retirement savings prior to the participation in the pension plan. Indeed, it is assumed that the incentives to retire would be similar for both a new public servant that may start participating in the PSPP at an older age and a long-term Reserve Force member that starts participating in the new Reserve Force pension plan. As a 31 March 2010, the average pensionable service to the credit of members of the Reserve Force is 2.3 years while the average enrolment period is 9.0 years.

For this valuation report the retirement rates were left unchanged with two exceptions. First, the rates for members with less than three completed years of pensionable service were determined on the basis of actual Reserve Force experience. Second, some adjustments were made to ensure a smooth transition from the rates based on Reserve Force experience and the rates from the PSPP. For members with less than three years of service the assumed rate was decreased by an average of 14% from the previous valuation for males and decreased by an average of 39% for females.

The following tables provide sample rates of pensionable retirement.

Table 23 Sample of Assumed Rates of Retirement
(Per 1,000 individuals)

Completed Years of Pensionable Service	Age - Male			Age - Female		
	49	54	59	49	54	59
5	21	44	142	28	45	115
10	15	27	157	14	31	153
15	8	18	169	11	27	197
25	7	13	245	13	28	322
30	15	232	307	19	281	342
35	35	577	417	35	530	307

D. Disability Retirement

The disability retirement experience over the intervaluation period was consistent with the disability rate assumption in the previous report. The disability rate assumption was left unchanged from the previous report as the level of experience did not justify updating the assumption.

Table 24 Sample of Assumed Rates of Pensionable Disability
(Per 1,000 individuals)

Age Last Birthday	Male	Female
25	0.2	0.7
35	0.3	1.7
45	0.4	3.6
55	2.1	6.8
59	3.6	8.2

E. Withdrawal

Withdrawal means ceasing to be a member of the Reserve Force for reasons other than death or retirement with an immediate annuity or an annual allowance.

Where credible experience was not available it was assumed, for the same reasons described in section 3 above, that the withdrawal rates that would best suit the Reserve Force pension plan would be those reported in the Actuarial Report on the Pension Plan for the Public Service of Canada as at 31 March 2008. Withdrawal rates for members with less than three years of pensionable service years were determined based on the Reserve Force experience covering plan years 2008 to 2010. Rates for members with three to eight years of pensionable service were adjusted to provide continuity between the rates based on Reserve Force experience and the rates based on the PSPP.

All the terminating members with more than two years of pensionable service are assumed to elect a transfer value rather than a deferred annuity.

Tables 25 to 28 provide sample rates of withdrawal.

Table 25 Sample of Assumed Withdrawal Rates - Male Officer
(Per 1,000 individuals)

Age Last Birthday	Completed Years of Pensionable Service						
	0	1	2	5	10	15	20+
20	17	29	20	20	-	-	-
25	22	28	20	20	18	-	-
30	18	30	22	22	18	11	-
35	21	26	23	23	18	11	9
40	17	26	21	21	18	11	9
45	18	27	20	20	18	11	9
50	18	-	-	-	-	-	-
55	36	-	-	-	-	-	-

Table 26 Sample of Assumed Withdrawal Rates - Male Other Rank
(Per 1,000 individuals)

Age Last Birthday	Completed Years of Pensionable Service						
	0	1	2	5	10	15	20+
20	46	55	43	43	-	-	-
25	48	66	42	42	18	-	-
30	36	54	39	39	18	11	-
35	24	43	31	31	18	11	9
40	24	35	26	26	18	11	9
45	18	31	24	24	18	11	9
50	22	-	-	-	-	-	-
55	38	-	-	-	-	-	-

Table 27 Sample of Assumed Withdrawal Rates - Female Officer
(Per 1,000 individuals)

Age Last Birthday	Completed Years of Pensionable Service						
	0	1	2	5	10	15	20+
20	14	25	48	29	-	-	-
25	16	27	46	29	18	-	-
30	18	29	37	29	18	11	-
35	21	27	32	29	18	11	9
40	14	27	27	27	18	11	9
45	12	27	26	26	18	11	9
50	18	-	-	-	-	-	-
55	23	-	-	-	-	-	-

Table 28 Sample of Assumed Withdrawal Rates - Female Other Rank
(Per 1,000 individuals)

	Completed Years of Pensionable Service						
Age Last Birthday	0	1	2	5	10	15	20+
20	35	47	46	46	-	-	-
25	44	51	48	48	18	-	-
30	45	53	44	44	18	11	-
35	24	53	38	38	18	11	9
40	21	54	34	34	18	11	9
45	26	54	32	32	18	11	9
50	23	-	-	-	-	-	-
55	22	-	-	-	-	-	-

F. Mortality

The mortality rate assumption and longevity improvement assumption used are the same as the assumptions used to produce the Actuarial Report on the Pension Plan for the Canadian Forces – Regular Force as at 31 March 2010. In the previous report the mortality rate assumption for disability pensioners was the mortality rate for 3A pensioners from the Actuarial Report on the Pension Plan for the Canadian Forces – Regular Force as at 31 March 2008. In this report the mortality rate assumption for disability pensioners is the same as the assumption for members and retirement pensioners. This reflects the fact that as of the valuation date all disability pensioners have been classified as disabled 3B pensioners.

Table 29 Sample of Assumed Rates of Mortality
(Per 1,000 individuals)

	Members and Retirement Pensioners			Surviving Spouses	
	Male				
Age Last Birthday	Officer	Other Rank	Female	Male	Female
30	0.5	0.7	0.4	1.0	0.2
40	0.7	1.0	0.5	1.5	0.5
50	1.2	2.6	1.3	3.4	5.6
60	3.8	8.9	3.8	9.7	8.1
70	14.5	22.5	12.1	25.3	18.9
80	46.8	68.3	36.6	65.4	45.0
90	147.0	154.9	111.4	166.0	126.3
100	315.0	328.6	287.3	340.3	331.8
110	500.0	500.0	492.4	500.0	500.0

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

Table 30 Sample of Assumed Longevity Improvement Factors

	Initial and Ultimate Plan Year Mortality Reductions (%)			
Age Last Birthday	Male		Female	
	2012	2031+	2012	2031+
30	2.87	0.80	1.59	0.80
40	2.18	0.80	1.34	0.80
50	1.89	0.80	1.28	0.80
60	2.38	0.80	1.41	0.80
70	2.58	0.80	1.49	0.80
80	2.08	0.70	1.49	0.70
90	1.19	0.44	0.70	0.44
100	0.35	0.30	0.10	0.30
110+	0.00	0.30	0.00	0.30

G. Family Composition

The assumptions regarding spouse survivors are the same as the assumptions used to produce the Actuarial Report on the Pension Plan for the Canadian Forces – Regular Force as at 31 March 2010.

Table 31 Assumptions for Survivor Spouse Allowances[1]

	Male		Female	
Age Last Birthday	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	0.57	(1)	0.49	1
40	0.75	(1)	0.51	2
50	0.78	(2)	0.52	1
60	0.78	(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	0.15	(9)	0.01	-

The assumptions regarding child survivors are the same as the assumptions used to produce the Actuarial Report on the Pension Plan for the Canadian Forces – Regular Force as at 31 March 2010.

To determine the value of pensions payable to eligible children, the rates of pension termination are assumed to be zero prior to age 17 and 16% per annum thereafter until expiry of the benefit on the 25th birthday.

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

Table 32 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	5	0.7	5
40	1.1	11	0.8	13
50	0.5	16	0.3	17
60	0.1	18	0.0	-
70	0.0	-	0.0	-

H. Other Assumptions

1. Wage Measure

Under Part I.1 the retirement benefit is based on the career average of the updated earnings. Past earnings are updated using the wage measure as defined in the schedule of the Reserve Force pension plan Regulations. The Regulations also prescribe the wage measures for calendar year 2007 and later as the greater of:

- the standard basic rate of pay for a period of duty or training of six hours or more before any retroactive adjustment — that was prescribed or established under the *National Defence Act* to be paid, on October 1 of the preceding year, to a member at the rank of Corporal (class A), and
- the wage measure of the previous year.

The wage measure for calendar years up to 2011 is shown in the following table.

Table 33 Wage Measure

Calendar Year	Rate of Pay ($)	Calendar Year	Rate of Pay ($)
2011	125.08	1985	40.00
2010	123.24	1984	38.25
2009	121.42	1983	36.25
2008	116.70	1982	33.25
2007	113.70	1981	29.25
2006	113.70	1980	25.75
2005	104.18	1979	25.75
2004	104.18	1978	24.50
2003	101.64	1977	21.00
2002	97.72	1976	21.00
2001	89.52	1975	17.37
2000	89.52	1974	12.20
1999	83.42	1973	12.20
1998	80.82	1972	12.10
1997	61.68	1971	10.50
1996	60.36	1970	10.10
1995	60.36	1969	7.17
1994	60.36	1968	7.17
1993	60.36	1967	7.17
1992	58.60	1966	7.17
1991	58.60	1965	6.50
1990	54.50	1964	6.50
1989	50.80	1963	6.50
1988	47.27	1962	6.23
1987	43.90	1961	6.23
1986	41.50	1960	5.67

2. 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 division was 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 division for the same reason.

3. Minimum Post-Retirement Death Benefit

This valuation does not take into account the minimum death benefit described in Note 17 of Appendix 1D, with respect of 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.

4. **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 Fund. In this report, the operating expenses of the PSPIB are still recognized implicitly.

All other pension plan administrative expenses are charged to the Fund. The experience of the last two plan years supported our current annual administrative expense assumption of 1.25% of total pensionable payroll.

5. **Financing of Elected Prior Service**

As with the previous valuation, this valuation assumed that the government would match members' contributions for elected prior service.

6. **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 members as at 31 March 2010 were ignored in this valuation. A more in-depth analysis will be conducted in the next valuation report scheduled for 31 March 2013.

For many of the terminations occurring in plan year 2010 it cannot yet be determined if the former member will elect a transfer value or deferred annuity. In the absence of such data the former member is assumed to be a deferred annuitant. This explains the large proportion of deferred annuitants over the total number of annuitants shown in Appendix 8.

7. **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.

8. **Recovery Rates for Disability Pensioners**

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

9. **Sex of Surviving Spouses**

Each eligible surviving spouse is assumed to be of the opposite sex

Appendix 7 - Reserve Force Pension Fund Projection

Since the inception of the Reserve Force pension plan on 1 March 2007 the plan has been financed through the Reserve Force Pension Fund. The Fund is credited with members and government contributions, investment earnings and with prior service contributions. The Fund is debited with benefit payments and administrative expenses.

The results of the following projection were computed using the data described in Appendix 8, the methodology described in Appendix 4 and the assumptions described in Appendices 5 and 6. The market value of assets was $235 million at the beginning of plan year 2011.

The projection shows the expected growth of the Pension Fund if all assumptions are realized. If a non-permitted surplus, as defined in footnote 1 of page 9, becomes known by the end of a plan year it may trigger an equivalent reduction in the following year's government contributions and this is reflected in this projection. The PSPIB is projected to receive positive cash flows until the end of plan year 2042. Emerging experience, differing from the corresponding assumptions, will result in gains or losses to be revealed in subsequent valuation reports.

Table 34 Pension Fund Projection
($ millions)

Plan Year	Beginning Assets	Contributions[1]	Benefit Payments	Investment Earnings	Present value of prior service contributions	Beginning Liability
2011	235	53	6	16	6	156
2012	299	58	7	20	6	214
2013	370	38[2]	9	23	6	279
2014	422	68	11	28	6	352
2015	507	73	12	33	6	432
2016	601	79	13	39	5	521
2017	706	84	14	46	5	620
2018	823	91	16	54	5	730
2019	952	97	17	63	5	853
2020	1,095	104	19	74	4	990
2025	2,061	145	32	138	2	1,913
2030	3,547	197	56	235	0	3,341
2035	5,757	266	94	380	0	5,475
2040	8,876	330	199	581	0	8,490
2041	9,589	339	236	627	0	9,178
2042	10,318	341	288	672	0	9,880
2043	11,044	316	349	717	0	10,577
2044	11,727	307	411	759	0	11,230
2045	12,382	297	477	799	0	11,853

1 Total current service cost plus prior service contributions.
2 Government contributions are reduced by $25 million based on the 31 March 2012 non-permitted surplus of $35 million.

Appendix 8 - Detailed Information on Membership Data

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

Table 35 Male Officers
Number and Average Annual Earnings[1] as at 31 March 2010

Age	0-4	5-9	10-14	15-19	20-24	25-29	30-34	35+	All Years of Service
15-19	3 $14,153								3 $14,153
20-24	423 $15,110								423 $15,110
25-29	778 $17,747	3 $16,136							781 $17,741
30-34	682 $16,354	2 $21,884	1 $17,141						685 $16,371
35-39	658 $16,693	1 $15,860		1 $9,755	2 $49,248				662 $16,779
40-44	599 $19,379			1 $0[2]	1 $2,202	2 $60,509			603 $19,455
45-49	559 $19,658				1 $80,742	1 $40,487	1 $7,018		562 $19,782
50-54	489 $18,809	1 $57,023	2 $15,131	1 $1,636	1 $432	3 $1,517			497 $18,696
55-59	403 $17,819						1 $0[2]	5 $16,879	409 $17,764
>59[3]	196 $11,623					1 $31,689		1 11,108	198 11,722
All Ages	4,790 $17,460	7 $23,580	3 $15,801	3 $3,797	5 $36,374	7 $28,249	2 $3,509	6 $15,917	4,823 $17,487

	31 March 2010	31 March 2008
Average age:	39.9	35.7
Average pensionable service:	2.8	1.3
Annualized pensionable payroll[4]:	$84,242,324	$87,359,120

1 As defined in Note 1 of Appendix 1-D.
2 Individuals with past earnings but with no current service cost's earnings.
3 As at 31 March 2010 these members are treated as pensioners.
4 The aggregate pensionable earnings of all contributors with less than 35 years of pensionable service.

Table 36 Male Other Ranks
Number and Average Annual Earnings[1] as at 31 March 2010

Age	0-4	5-9	10-14	15-19	20-24	25-29	30-34	35+	All Years of Service
15-19	875 $17,394								875 $17,394
20-24	4,529 $20,624	2 $32,953							4,531 $20,630
25-29	2,800 $22,057	10 $25,786	4 $15,629						2,814 $22,061
30-34	1,250 $19,920								1,250 $19,920
35-39	903 $18,524				2 $14,901				905 $18,516
40-44	636 $18,966	1 $47,560							637 $19,010
45-49	479 $18,240				1 $7,127	1 $461			481 $18,180
50-54	300 $17,068						1 $13,134		301 $17,055
55-59	140 $16,674				1 $7,457				141 $16,609
>59[2]	29 $3,808								29 $3,808
All Ages	11,941 $20,131	13 $28,564	4 $15,629	0 $0	4 $11,096	1 $461	1 $13,134	0 $0	11,964 $20,133

	31 March 2010	31 March 2008
Average age:	28.8	26.0
Average pensionable service:	2.4	1.0
Annualized pensionable payroll[3]:	$240,870,843	$225,928,530

1 As defined in Note 1 of Appendix 1-D.
2 As at 31 March 2010 these members are treated as pensioners.
3 The aggregate pensionable earnings of all contributors with less than 35 years of pensionable service.

Table 37 Female Officers
Number and Average Annual Earnings[1] as at 31 March 2010

Age	0-4	5-9	10-14	15-19	20-24	25-29	30-34	35+	All Years of Service
20-24	311 $10,387								311 $10,387
25-29	532 $10,764	1 $16,361							533 $10,774
30-34	369 $14,695			1 $74,254					370 $14,856
35-39	262 $16,553								262 $16,553
40-44	226 $17,139	1 $55,793			2 $83,096				229 $17,884
45-49	187 $14,706								187 $14,706
50-54	167 $12,848				1 $0[2]	1 $93,513	1 $0[2]		170 $13,171
55-59	95 $16,762								95 $16,762
>60[3]	60 $12,504								60 $12,504
All Ages	2,209 $13,503	2 $36,077	0 $0	1 $74,254	3 $55,397	1 $93,513	1 $0	0 $0	2,217 $13,637

	31 March 2010	31 March 2008
Average age:	36.2	33.8
Average pensionable service:	2.7	1.2
Annualized pensionable payroll[4]:	$30,233,572	$30,777,159

1 As defined in Note 1 of Appendix 1-D.
2 Individuals with past earnings but with no current service cost's earnings.
3 As at 31 March 2010 these members are treated as pensioners.
4 The aggregate pensionable earnings of all contributors with less than 35 years of pensionable service.

Table 38 Female Other Ranks
Number and Average Annual Earnings[1] as at 31 March 2010

Age	0-4	5-9	10-14	15-19	20-24	25-29	30-34	35+	All Years of Service
15-19	128 $17,671								128 $17,671
20-24	934 $20,423	2 $31,684							936 $20,447
25-29	665 $21,391	1 $42,405	1 $69,933						667 $21,495
30-34	335 $17,664	1 $3,221	2 $9,341						338 $17,572
35-39	222 $20,676	1 $47,374							223 $20,796
40-44	140 $22,526								140 $22,526
45-49	122 $23,610	2 $29,008			1 $34,715				125 $23,785
50-54	90 $20,736	1 $4,151							91 $20,553
55-59	23 $22,277								23 $22,277
>59[2]	2 $3,353								2 $3,353
All Ages	2,661 $20,477	8 $27,317	3 $29,538	0 $0	1 $34,715	0 $0	0 $0	0 $0	2,673 $20,513

	31 March 2010	31 March 2008
Average age:	29.6	27.4
Average pensionable service:	2.5	1.1
Annualized pensionable payroll[3]:	$54,830,929	$55,953,063

1 As defined in Note 1 of Appendix 1-D.
2 As at 31 March 2010 these members are treated as pensioners.
3 The aggregate pensionable earnings of all contributors with less than 35 years of pensionable service.

Table 39 Officer Male - Retirement Pensioners
Number and Average Annual Pension as at 31 March 2010

Age	Number	Average
45-49	1	$1,280
55-59	5	10,979
60-64	46	8,962
65-69	41	1,675
All Ages	93	$5,775

	31 March 2010
Average age	63.5
Average age at retirement	62.3

Table 40 Officer Female - Retirement Pensioners
Number and Average Annual Pension as at 31 March 2010

Age	Number	Average
60-64	4	$14,869
65-69	4	2,035
All Ages	8	$8,452

	31 March 2010
Average age	63.8
Average age at retirement	62.2

Table 41 Other Rank Male - Retirement Pensioners
Number and Average Annual Pension as at 31 March 2010

Age	Number	Average
55-59	4	$12,985
60-64	5	5,158
65-69	1	461
All Ages	10	$7,819

	31 March 2010
Average age	60.3
Average age at retirement	59.1

Table 42 Other Rank Female - Retirement Pensioners
Number and Average Annual Pension as at 31 March 2010

Age	Number	Average
50-54	1	$21,660
60-64	1	1,519
All Ages	2	$11,590

	31 March 2010
Average age	58.3
Average age at retirement	56.7

Table 43 Officer Male - Disability Pensioners
Number and Average Annual Pension as at 31 March 2010

Age	Number	Average
45-49	1	$5,247
50-54	1	7,421
55-59	2	13,865
60-64	1	5,319
All Ages	5	$9,143

	31 March 2010
Average age	54.9
Average age at retirement	53.4

Table 44 Other Rank Male - Disability Pensioners
Number and Average Annual Pension as at 31 March 2010

Age	Number	Average
50-54	2	$9,987
55-59	1	24,809
All Ages	3	$14,928

	31 March 2010
Average age	53.9
Average age at retirement	52.7

Table 45 Deferred Annuitant - Officer Male
Number and Average Annual Pension as at 31 March 2010

Age	Number	Average
<30	15	$963
30-34	15	1,571
35-39	18	1,870
40-44	15	1,476
45-49	11	2,968
50-54	16	2,118
55-59	21	3,208
All Ages	111	$2,051

	31 March 2010
Average age	43.0
Average age at retirement	42.3

Table 46 Deferred Annuitant - Officer Female
Number and Average Annual Pension as at 31 March 2010

Age	Number	Average
<30	32	$854
30-34	11	1,354
35-39	8	1,977
40-44	1	1,694
45-49	5	4,166
50-54	10	1,870
55-59	3	1,917
All Ages	70	$1,500

	31 March 2010
Average age	35.6
Average age at retirement	34.9

Table 47 Deferred Annuitant - Other Rank Male
Number and Average Annual Pension as at 31 March 2010

Age	Number	Average
<30	239	$1,164
30-34	60	1,791
35-39	38	1,804
40-44	22	2,315
45-49	14	2,570
50-54	12	2,826
55-59	8	2,918
All Ages	393	$1,523

	31 March 2010
Average age	30.9
Average age at retirement	30.2

Table 48 Deferred Annuitant - Other Rank Female
Number and Average Annual Pension as at 31 March 2010

Age	Number	Average
<30	67	$1,067
30-34	24	2,377
35-39	12	2,313
40-44	7	2,665
45-49	8	7,052
50-54	9	5,074
55-59	2	1,914
All Ages	129	$2,177

	31 March 2010
Average age	32.6
Average age at retirement	31.8

Table 49 Surviving Spouses - Female
Number and Average Annual Allowance as at 31 March 2010

Age	Number	Average
30-34	1	$3,007
35-39	1	351
45-49	2	969
50-54	1	21,074
All Ages	5	$5,080

	31 March 2010
Average age	42.0
Average age at death of member	41.6

Appendix 9 - Acknowledgements

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

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

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