ACTUARIAL REPORT

31 March 1996

Life Insurance Plan

Public Service of Canada

27 February 1998

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

Dear Minister:

Pursuant to section 59 of the *Public Service Superannuation Act* (PSSA), and its
reference to the *Public Pensions Reporting Act*, I am pleased to submit my report on the
actuarial review as at 31 March 1996 of the life insurance plan established under Part
II - *Supplementary Death Benefits* of the PSSA.

Yours sincerely,

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Chief Actuary
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APPENDICES

I- Overview

The financial soundness of the life insurance plan established for the members of the Public Service of Canada under Part II - *Supplementary Death Benefits* (SDB) of the *Public Service Superannuation Act* (PSSA) rests on the balance in the Public Service Death Benefit (PSDB) Account which forms part of the public debt of Canada. The plan is not funded through investment in marketable securities. The plan's assets are in effect borrowed by the government.

A- Raison d'être of this Actuarial Report

This actuarial review of the SDB plan was made as at 31 March 1996 pursuant to section 59 of the PSSA and its reference to the *Public Pensions Reporting Act* (PPRA). The previous review was made as at 31 December 1992. This report is thus the first to be based on fiscal years rather than calendar years. The date of the next periodic review contemplated by the PPRA is 31 March 1999.

In accordance with accepted actuarial practice, and both the PSSA and the PPRA, the main purpose of this report is to present a realistic long-term projection of the assets, liabilities and surplus of the plan at the end of each plan year[1] of the projection period in order to assess the adequacy of the legislated contribution rates.

B- Main Findings

1. As at 31 March 1996, the plan had a surplus of $1,032.6 million resulting from assets of $1,232.8 million and liabilities of $200.2 million.

2. The current surplus of $1,032.6 million in the PSDB Account is projected to reach $34,619.0 million at the end of plan year 2050 and to continue to increase indefinitely in the future thereafter. The surplus projected at the end of plan year 2050 represents 98.4 times the annual benefits projected to be paid during the following plan year. This progression is due to the sum of legislated contributions and projected investment earnings exceeding the projected benefits in each plan year.

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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.

C- Developments Since the Previous Report's Date

The above estimates are based on key ultimate economic assumptions unchanged from those of the previous report, i.e. a new money interest rate of 6% and an annual rate of increase in salaries of 4%.

The valuation date of the previous review was 31 December 1992. It incorporated most of Bill C-55's applicable changes except one that was then not yet effective. This change, which became effective 4 July 1994, is incorporated in this report and allows part-time employees working at least 12 hours per week to contribute to the PSSA and thereby become eligible for SDB coverage.

Bill C-31, which received Royal Assent 20 June 1996, includes an important amendment to the PSSA allowing participants to continue their coverage under the SDB plan when they cease to be employed in the Public Service after at least two, instead of five, years of pensionable service.

In addition, elective participants in receipt of an annual allowance are entitled effective 1 April 1995 to pay the same contribution rate as elective participants in receipt of an immediate annuity. Prior to that date, elective participants in receipt of an annual allowance were treated as elective participants entitled to a deferred annuity and were required to pay the contribution rate as shown on page 22, if they elected to continue coverage. The valuation results are not materially affected by this change.

Furthermore, the privatization of certain positions (approximately 6,000) under an arrangement with NAVCAN became effective 1 November 1996. These participants are accordingly excluded from this valuation. The effect of this privatization on the valuation results is not material and is shown in section V-E, page 18.

The provisions of the plan deemed to apply for purposes of this report are described in Appendix 1 (page 21) and reflect those that were in effect as at the valuation date.

II- Data

A- Asset Data

1. Reconciliation of Balances in the PSDB Account

	(in millions of dollars)			
Account balance as at 31 December 1992				919.6
Net Cash Flow from 1 January 1993 to 31 March 1993				19.3
Plan year	1994	1995	1996	1994-96
Public Accounts opening balance	938.9	1,027.9	1,123.3	938.9
INCOME				
Employee contributions	64.1	63.8	63.0	190.9
Employer contributions for term	7.9	7.7	7.5	23.1
Single Premium for paid-up	1.4	1.4	1.4	4.2
Investment earnings	99.7	107.0	116.4	323.1
Subtotal	173.1	179.9	188.3	541.3
EXPENDITURES				
Benefits	84.1	84.5	80.1	248.7
Public Accounts closing balance	1,027.9	1,123.3	1,231.5	1,231.5
Contributions receivable			1.3	1.3
Account balance as at 31 March 1996			1,232.8	1,232.8

The above table shows the reconciliation of the PSDB Account from the previous valuation date to the current valuation date. Since the previous report's date, the Account balance has grown by $313.2 million (i.e. a 34.1% increase) to reach $1,232.8 million as at 31 March 1996.

2. Rates of Return

The following rates of return on the Account in each of the last three plan years were calculated, using the foregoing entries, on the assumption that all transactions other than investment earnings occurred at the midpoint of the plan year:

1994	**1995**	**1996**
10.68%	10.46%	10.40%

3. Sources of Asset Data

The Account entries shown in item 1 above were taken from the Public Accounts of Canada. In accordance with section 8 of the *Public Pensions Reporting Act*, the Office of the Comptroller General of Canada provided a certification of the assets of the plan as at 31 March 1996.

B- Membership

1. Highlights

As at 31 March 1996, the Supplementary Death Benefit plan included 385,959 participants[1]. Of this number, 273,237 were non-elective participants, 105,241 were elective participants in receipt of an immediate annuity (retirement and disability), 23 were elective participants entitled to a deferred annuity and 7,458 were elective participants in receipt of an annual allowance. The total amount of death benefits insured at that date was $26,011.5 million.

2. Validation of Membership Data

The following validation tests were done to the valuation input data:

(a) Status-Related Tests

These tests relate to the status at valuation date (e.g. non-elective participants, elective participants entitled to an immediate annuity, a deferred annuity or an annual allowance, terminated participants, employees of Crown corporations and public boards excluded by regulations) and the consistency in the changes during the intervaluation period. They are explained in detail in the actuarial report as at 31 March 1996 on the pension plan for the Public Service of Canada.

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[1] See Appendix 1 (page 21) for the definition of the various categories of participants.

(b) Benefit-Related Tests
Consistency tests were made to ensure that all proper information to value the participants' benefits based on their status as at 31 March 1996 was included:

i) Tests Performed for the Actuarial Report as at 31 March 1996 on the Pension Plan for the Public Service of Canada
Verification of service, age and salary (salary at termination of employment for elective participants) and corrections to the data if necessary was done for the actuarial report as at 31 March 1996 on the pension plan for the Public Service of Canada.

ii) Tests Related to the Supplementary Death Benefit
- verification of the maximum insured amount of elective participants over age 70 (i.e. maximum $5,000 paid-up benefit)
- verification of number of elective participants in receipt of an annual allowance who elected coverage
- verification that the insured benefit is reasonably consistent in comparison to the salary (at cessation of employment for elective participants)

(c) Adjustments to Status and Benefit Data
Based on the omissions and discrepancies identified by the tests mentioned above and other tests, appropriate adjustments were made to the basic data after consulting with the data providers.

3. Source of Membership Data
The valuation input data required in respect of participants are extracted from master computer files maintained by the Superannuation Directorate of the Department of Public Works and Government Services Canada. The Compensation Systems Branch of that department is responsible for the computer programs designed for the extraction of these valuation data from the master files. The co-operation and able assistance received from the above-mentioned data providers deserve to be acknowledged.

III- Methodology

A- Assets

The assets of the plan consist exclusively of the balance, recorded on a book value basis, in the PSDB Account, which forms part of the Public Accounts of Canada. The earning power of the assets corresponds to the yields, shown on page 9, that are projected on an open-group basis as described in the actuarial report as at 31 March 1996 on the pension plan for the Public Service of Canada.

The Account balance corresponds to the excess of past contributions and investment earnings over past benefit payments. Assets are accordingly projected at the end of a given plan year by adding to the PSDB Account at the beginning of that plan year the net income (i.e. the excess of contributions and investment earnings over benefits) projected as described below for that plan year. Administration expenses are ignored because they are not charged to the PSDB Account.

B- Contributions

Participants' annual contributions are projected for a given plan year by multiplying the legislated contribution rates (Section C-1 of Appendix 1) by the salaries, projected for that plan year using the assumed rates of increase described in Section IV-A below (salary increases are deemed to stop when a non-elective participant becomes an elective participant), of participants projected for that plan year on an open-group basis as described in Section IV-C below. Furthermore, projected contributions take into account the annual 10% reduction in insured benefits from age 61 onward and the $5,000 insurance portions paid-up by the government from age 65.

The government's annual contribution is projected for a given plan year as the sum of one-twelfth of the total amount of death benefits (excluding the $5,000 paid-up portions of insured benefits) projected to be paid during that plan year as described in Section D below and the total legislated single premiums (Section C-3-(b) of Appendix 1) in respect of relevant (retiring) participants 65 to 75 years of age.

C- Investment Earnings

Annual investment earnings are projected for a given plan year as the product of the yield projected for that plan year (Section IV-A below) and the sum of the Account projected to the beginning of that plan year plus about[1] 50% of the difference between contributions (item B above) and benefits (item D below) projected for that plan year.

D- Benefits

The total amount of death benefits (term and paid-up insurance) for a given plan year is projected as the total amount of insured death benefits in force during that plan year multiplied by the mortality rates assumed to apply during that plan year (Section IV-C-2 below). The amount of insured death benefits depends on the salary projected to time of death. Salaries are projected for this purpose using the assumed rates of increase in salaries (Section IV-A below) and the number of participants projected on an open-group basis as described in Section IV-C below.

E- Liabilities

1. In respect of the individual $5,000 paid-up portions of insured benefits, liabilities at the end of a given plan year correspond to the amount which, together with interest at the projected yields (page 9), is sufficient to pay for each individual $5,000 portion of insured benefit on the eventual death, projected on the basis of the assumed mortality rates (Section IV-C), of all projected participants insured as at 31 March of that plan year.

2. The margin against adverse fluctuations at the end of a given plan year is held only in respect of the insurance paid for on a term basis and corresponds to the amount which, added to the benefit payments projected for that plan year, provides a 99.5% statistical probability that actual benefit payments of that plan year will not exceed the sum of this margin and the benefit payments projected for that plan year. It is deemed equal, assuming that the distribution of the number of deaths is binomial, to 2.6 times the standard deviation in the plan year's expected amount of death benefits. For a given plan year, the standard deviation is deemed equal to the square root of the product of the plan year's expected number of deaths and the square of the plan year's average amount of insurance.

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[1] The multiplying factor actually used for one half year of interest is $\left[(1+y)^{1/2} - 1\right]$, where "y" corresponds to the yield projected for the plan year.

3. On the basis of the plan's experience, the reserve at the end of a given plan year for claims incurred but not reported, and reported but not paid, (IBNR/RNP), is set equal to one-sixth of the projected annual benefits paid on average during the six previous plan years.

4. Due to the negligible effect of the 30-day extension of insurance upon termination of coverage and to the nature of term insurance paid for on a monthly basis, no liability is deemed to exist in respect of that term insurance provision.

F- Membership Data

This valuation is as at 31 March 1996 but the majority of the individual demographic data for the PSSA valuation has been gathered as at 31 December 1995, a period of three months sooner. The method used for updating the data assumes a modified stationary population as described in the actuarial report as at 31 March 1996 on the pension plan for the Public Service of Canada. Sample data in respect of participants are shown as at 31 March 1996 in the summaries of data in Appendix 3, starting on page 35.

For valuation purposes, data for non-elective participants were grouped by sex, by age (last birthday) and completed number of years of service. Data for elective participants were grouped only by sex and by age (last birthday).

Due to their negligible effect on costs and liabilities, the 23 elective participants entitled to a deferred annuity were not taken into consideration for the purpose of this valuation. Also, the Transport Canada positions being privatized under an arrangement with NAVCAN in November 1996 were excluded from the valuation.

For valuation purposes, the non-elective participants were divided into two subcategories (as was the case for the actuarial report as at 31 March 1996 on the pension plan for the Public Service of Canada):

- the Air Traffic Controllers (ATC) in operational service and Correctional Services Canada employees in operational service
- the main group (i.e. the others).

IV- Assumptions

A- Economic Assumptions

For purposes of projecting the PSDB Account to the end of each future plan year, the economic assumptions, including the assumed seniority and promotional increases, are those adopted for the actuarial report as at 31 March 1996 on the pension plan for the Public Service of Canada. They are summarized in table 2A of page 26 and in the table below:

Plan Year	Projected Fund Yield	Non-Elective Participants' Average Salary Increase[1]
1997	10.11%	0.7%
1998	9.97	1.9
1999	9.73	3.3
2000	9.47	3.5
2001	9.16	3.7
2002	8.81	3.9
2003	8.41	4.0
2004	8.14	4.0
2005	7.89	4.0
2010	6.97	4.0
2015	6.28	4.0
2020	6.02	4.0
2021+	6.00	4.0

B- Administrative Expenses

In projecting the Account, no assumption was made regarding the expenses incurred for the administration of the plan. These expenses, which are not charged to the PSDB Account, are borne entirely by the government and are commingled with all other government expenses.

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[1] Exclusive of the seniority and promotional increases.

C- Demographic Assumptions

Except where otherwise noted, all demographic assumptions were determined from the plan's own experience as was done in the past. Assumptions of the previous valuation were updated to reflect the experience of January 1993 to March 1996.

1. **New Non-Elective Participants**

   The projection of future new non-elective participants (defined in Section A-1 of Appendix 1) is required in the valuation process because this valuation is done on an open-group basis (i.e. assets and liabilities are estimated at the end of each plan year of the projection period taking into account future new participants to the plan). The assumption used is derived from that assumed for purposes of the actuarial report as at 31 March 1996 on the pension plan for the Public Service of Canada.

   For the first two years following the valuation date, it was assumed that the total number of new non-elective participants would be equal to 97 % of the number of total terminations (corresponding to the 17,000 or 3% expected decrease for the PSSA active population arising from the non-replacement of contributors terminating under the ERI program and the Early Departure Incentive program). After two years, it was assumed that the number of new non-elective participants would be equal to the year's assumed number of terminations.

   The expected decrease differs from the PSSA plan since the non-elective participant population of the PSDB plan is different from the contributor population of the PSSA plan (the PSDB plan does not cover employees of certain Crown corporations and public boards). Furthermore, the decrease in population will be applied to the total non-elective participant population as opposed to the PSSA valuation for which the decrease only applies to the full-time contributors of the "Main group".

   It was also assumed that the distribution of future new non-elective participants by age, sex and initial salary rate would be the same as non-elective participants with less than one year of service at the valuation date.

2. **Mortality Rates and Longevity Improvement Factors**

   Mortality rates are used for both the computation of death benefits and the survivorship of the participants beyond the valuation date. The mortality rates deemed to apply after plan year 1996 are those used in the actuarial report as at 31 March 1996 on the pension plan for the Public Service of Canada.

(a) Non-Elective Participants and Elective Participants in Receipt of an Immediate Annuity or an Annual Allowance (for Reasons Other than Disability)

The mortality rates deemed to apply to non-elective participants in the plan year following the valuation date were assumed to vary by age and sex and were set equal to 97.5% of the graduated average 1990-1995 PSSA experience of actives and non-disabled pensioners, reduced by 3.75 years of mortality improvement. These rates are also applicable to non-disabled elective participants and are shown in table 2H of page 32.

Mortality rates deemed to apply after 31 March 1997 are adjusted on account of expected future improvements in longevity. The corresponding longevity improvement factors shown in table 2I of page 33 were used for all participants. The projection scale used is a modification of Projection Scale AA of the Society of Actuaries used with the UP(uninsured pensioner)-94 mortality table. A factor of 0.25% was added to all non-zero factors to reflect a portion of the difference between scale AA and recent PSSA experience. The overall effect of changing longevity improvement factors is to decrease projected male deaths by approximately 0.3% per annum and to increase female deaths by approximately 0.4% per annum.

(b) Elective Disability Participants

For elective disability participants, the mortality rates deemed to apply in the year following the valuation date are the same as the previous valuation 1993 base rates (i.e. rates were not projected 3.25 years for deemed improvements in longevity).

A sample of rates deemed to apply in the year following the valuation are shown in table 2H of page 32.

3. Other Demographic Assumptions

For non-elective participants, the probabilities of terminating employment and the assumed annuity benefit elections (annual allowance versus immediate annuity) are the same as the corresponding probabilities assumed for purposes of the actuarial report as at 31 March 1996 on the pension plan for the Public Service of Canada (tables 2B to 2F of pages 27 to 30). It was assumed, *inter alia*, that terminations without right to a pension, pensionable disabilities and retirements were permanent and that therefore no subsequent re-entry would occur.

4. Coverage Elections and Options

(a) The previous Actuarial Report as at 31 December 1992 assumed that all participants retiring with an immediate annuity retained SDB coverage. Since recent experience indicates that the actual number of participants electing SDB coverage at termination is significantly lower than expected, revised proportions were determined.

The revised 1996 assumption, which varies by sex and age, was based on the 1993-95 PSSA experience. The assumed proportions (shown in table 2J of page 34) were derived by applying the Whittaker-Henderson graduation method to the crude rates.

(b) The valuation data indicate that the percentage of elective participants opting to reduce their amount of insured death benefit to $5,000 is negligible. Accordingly, no elective participants were assumed to make such an option.

V- Results

A- Balance Sheet as at 31 March 1996

The following balance sheet was prepared using the data described in Section II, the methodology described in Section III and the assumptions described in Section IV.

Assets	($ millions)
Balance of PSDB Account	1,231.5
Contributions and interest due	1.3
Total assets	**1,232.8**

Liabilities	
Actuarial liability in respect of the paid-up insured death benefit for participants at ages 65 and over	180.9
Reserve for claims incurred but unreported, and for claims reported but not paid	14.1
Margin against adverse fluctuations	5.2
Total liabilities	**200.2**

Surplus	**1,032.6**

B- Comparing Benefit Cost Rates to Legislated Contribution Rates

1. **Short Term**
   The aggregate amount of death benefit payments projected for plan year 1997 is $89.1 million, that is $70.7 million in respect of the term insurance (two times annual salary) and $18.4 million in respect of the paid-up insurance (individual $5,000 portions).

   (a) **Paid-Up Insurance**
   For plan year 1997, the estimated single premium at age 65 for each $5,000 of insured benefit is $1,616 and $1,306 for males and females, respectively. The corresponding legislated contribution rates (item C-3.(b) of page 23) for each $5,000 of paid-up insured benefits are $310 and $291, respectively.

   (b) **Term Insurance**
   The amount of total benefits projected to be paid during plan year 1997 is $70.7 million. Considering the total amount of insured benefits of $25,251.6 million projected for plan year 1997, the benefit cost rate projected for plan year 1997 is $0.233 per month per $1,000 of insured benefit, i.e. $1,000 * $70.7 / $25,251.6 / 12.

   Non-elective participants and elective participants in receipt of an immediate annuity or an annual allowance are required to contribute monthly $0.20 per $1,000 of insured benefit. As a minimum, the government contributes monthly an amount equal to one-twelfth of the actual total amount of death benefits payable during the month (excluding the $5,000 paid-up portions). For plan year 1997, the government's monthly contribution is estimated at $0.019 per $1,000 of insured benefit, i.e. $0.233 / 12.

   Therefore, the total amount contributed by participants and the government is $0.219 ($0.20 + $0.019) per month per $1,000 of insured benefit, i.e. slightly less than the estimated monthly cost (second paragraph above) of $0.233 per $1,000 of insured benefit for plan year 1997.

2. Long Term

(a) Paid-Up Insurance

The assumed improvements in longevity cause the projected single premium for the paid-up insurance to decrease over time. However, the projected ultimate yield of 6.0% is lower than the yield of 10.11% projected for plan year 1997. This has the effect of increasing gradually the projected single premium over the years. The net effect of longevity improvements and decreasing projected yields, on the projected single premiums at age 65 for each $5,000 of insured benefit, is for males a decrease from $1,616 for plan year 1997 to $1,553 for plan year 2050, and for females an increase from $1,306 to $1,451. The corresponding legislated contribution rates (item C-3.(b) of page 23) for each $5,000 of paid-up insured benefits are $310 and $291, respectively.

(b) Term Insurance

The monthly benefit cost rate per $1,000 of term insurance is projected to fluctuate between $0.229 and $0.238 in the first 10 years. Thereafter, the monthly cost is projected to decrease gradually to $0.134 by plan year 2050. This $0.134 cost rate compares to the combined (government and participants) legislated contribution rate of $0.211 (i.e. $0.20 for participants plus one-twelfth of $0.134 for government) projected for plan year 2050.

The following table illustrates the projected monthly benefit cost rates per $1,000 of insured death benefit for selected plan years.

Projected Monthly Benefit Cost
per $1,000 of Insured Death Benefit

Plan Year	1997 $	2005 $	2015 $	2030 $	2050 $
Non-elective participants	0.137	0.144	0.126	0.101	0.075
Elective participants	0.845	0.698	0.639	0.561	0.421
All participants	0.233	0.232	0.230	0.172	0.134

For non-elective participants, the monthly cost projected for plan year 2050 is 55% of the monthly cost estimated for plan year 1997. This results mainly from the following two factors:

i)   There is a significant reduction in cost due to the assumed lower mortality for plan year 2050 in accordance with the longevity improvement factors shown in table 2I (page 33) applied to the current mortality rates shown in table 2G (page 31).

ii)   The distribution of non-elective participants in the plan year 2050 is weighted more heavily at the older ages than currently. This has the effect of increasing costs. However, this increase is more than offset by the effect of the assumed mortality improvements.

In respect of elective participants in receipt of an immediate annuity or an annual allowance, the monthly benefit cost rate projected for plan year 2050 is 50% of the monthly benefit cost rate estimated for plan year 1997. This reduction is mostly the result of assumed mortality improvements.

In aggregate, for non-elective participants and elective participants in receipt of an immediate annuity or an annual allowance, the monthly benefit cost rate projected for 2050 is 58% of the monthly benefit cost rate estimated for plan year 1997.

C- Surplus

1. Short Term
The surplus was $1,032.6 million as at 31 March 1996. It corresponds to 11.6 times the total amount of death benefits projected for plan year 1997. By comparison, the surplus as at 31 December 1992 under the previous report was $730.4 million. It corresponded to 7.6 times the amount of death benefits payable during calendar year 1993.

2. Long Term
As shown in section F below and explained in section B above, the projected participants' and government's contributions are less than the projected benefits for future plan years up to 2024. However, total income exceeds total expenditures every year of the projection period because investment earnings more than offset the excess of benefits over contributions until plan year 2024. The following table shows the ratio of projected surplus at the end of the plan year to annual benefit payments projected for the following plan year.

Ratio of Projected Surplus at the End of the Plan Year to Annual Benefit Payments Projected for the Following Plan Year

1996	2005	2015	2030	2050
11.6	18.3	24.4	46.7	98.4

D- Sensitivity of Valuation Results to Variations in Key Assumptions

The following supplementary estimates indicate the degree to which some of the valuation results depend on some of the key assumptions. The differences between the results below and those shown in sections B, C and F can also serve as a basis for approximating the effect of other numerical variations in a key assumption, to the extent that such effects are indeed linear.

1. Projected Investment Yields

The valuation reflects a deemed investment policy of buying and holding until maturity long-term Government of Canada bonds. If the investment portfolio also included a significant equity component, it would be appropriate to project higher rates of return. As a measure of sensitivity, an increment of one percentage point in the projected yields would increase the surplus projected at the end of the fiscal year by 57%.

2. Mortality

If the mortality rates assumed in each future year were reduced by 10%, then the monthly benefit cost rate of $0.134 projected for 2050 would be reduced in the same proportion to $0.121.

If the assumed improvements in longevity after the 1997 plan year were disregarded, then the monthly benefit cost rate of $0.134 projected for 2050 would climb to $0.289.

E- Reconciliation of Results with Previous Report

The following table indicates that the revised assumed longevity improvements are the main reason for the decrease in the projected benefit cost rate from $0.146 shown in the previous report to that of $0.134 of this report.

	Monthly Cost Projected for Plan Year 2050 per $1,000 of Insured Death Benefit (excluding paid-up insurance)	Ratio of Surplus at End of Plan Year 2050 to Benefit Payments Projected for Following Plan Year (including paid-up insurance)
As at 31 December 1992	**$0.146**	**62.9**
Intervaluation economic experience and inclusion of participants in receipt of an annual allowance	(0.001)	14.0
Changes in demographic assumptions (other than mortality)	0.004	2.6
Changes in assumed mortality rates	(0.005)	7.8
Changes in longevity improvement factors	(0.009)	7.4
Assumed proportion electing SDB at retirement	(0.006)	5.6
Changes in assumed new non-elective participants	0.001	3.1
Change in economic assumptions	-	(3.5)
Exclusion of participants covered by the transfer agreement with NAVCAN	-	1.6
Change in IBNR/RNP reserve projection methodology	-	1.2
Other methodology refinements	0.004	(4.3)
As at 31 March 1996	**$0.134**	**98.4**

F- Account Projection

The Account projection shown on the next page was prepared using the data described in Section II, the methodology described in Section III and the assumptions described in Section IV. Figures are expressed in thousands of dollars.

	Income and Expenditure During the Plan Year								Balance Sheet at the End of the Plan Year					
		Contributions					Benefit Payments			Liabilities				
			Government											
Plan Year	Investment Earnings	Participants	Term	Paid-up	Total	Term	Paid-up	Total	Account	Paid-up	IBNR/RNP	Margin	Total	Surplus
1996	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	1,232,814	180,939	14,131	5,164	200,234	1,032,581
1997	123,563	60,424	5,890	1,351	67,665	70,675	18,444	89,119	1,334,923	186,841	14,213	5,180	206,234	1,128,690
1998	131,943	60,479	5,896	1,315	67,690	70,750	18,929	89,679	1,444,878	192,491	14,309	5,404	212,204	1,232,674
1999	139,489	61,381	5,970	1,284	68,635	71,635	19,385	91,020	1,561,981	197,755	15,045	5,656	218,456	1,343,525
2000	146,792	63,514	6,128	1,219	70,861	73,537	19,803	93,340	1,686,294	202,374	15,602	5,938	223,914	1,462,381
2001	153,365	65,914	6,327	1,158	73,399	75,924	20,179	96,103	1,816,955	206,210	16,182	6,253	228,645	1,588,311
2002	158,972	68,601	6,573	1,029	76,203	78,876	20,506	99,382	1,952,747	208,752	16,943	6,602	232,297	1,720,451
2003	163,309	71,582	6,869	1,050	79,501	82,422	20,766	103,188	2,092,369	210,654	17,465	6,981	235,100	1,857,270
2004	169,340	74,820	7,206	1,103	83,129	86,470	20,987	107,457	2,237,381	212,286	18,044	7,370	237,700	1,999,681
2005	175,572	78,248	7,578	1,112	86,938	90,941	21,169	112,110	2,387,782	213,448	18,709	7,769	239,926	2,147,856
2006	181,756	81,881	7,985	1,135	91,001	95,824	21,303	117,127	2,543,412	214,248	19,443	8,166	241,857	2,301,556
2007	188,799	85,711	8,419	1,140	95,270	101,032	21,392	122,424	2,705,058	214,702	20,246	8,520	243,468	2,461,590
2008	196,381	89,738	8,867	1,177	99,782	106,405	21,433	127,838	2,873,383	215,061	21,114	8,884	245,059	2,628,325
2009	203,732	93,944	9,317	1,132	104,393	111,806	21,436	133,242	3,048,266	214,852	22,033	9,245	246,130	2,802,136
2010	211,387	98,274	9,760	1,173	109,207	117,124	21,387	138,511	3,230,349	214,631	22,985	9,597	247,213	2,983,136
2011	219,110	102,708	10,188	1,268	114,164	122,256	21,306	143,562	3,420,061	214,723	23,952	9,952	248,627	3,171,434
2012	223,719	107,220	10,594	1,619	119,433	127,123	21,204	148,327	3,614,885	216,481	24,914	10,280	251,675	3,363,210
2013	232,235	111,821	10,968	1,928	124,717	131,616	21,138	152,754	3,819,083	219,982	25,850	10,604	256,436	3,562,648
2014	242,019	116,482	11,309	2,022	129,813	135,713	21,110	156,823	4,034,092	224,057	26,747	10,924	261,728	3,772,364
2015	252,471	121,183	11,619	2,052	134,854	139,426	21,075	160,501	4,260,916	228,410	27,592	11,245	267,247	3,993,669
2020	318,918	146,054	12,719	2,104	160,877	152,633	20,909	173,542	5,614,755	253,768	30,828	12,992	297,588	5,317,167
2025	424,235	175,444	13,725	1,900	191,069	164,699	21,204	185,903	7,498,379	280,938	33,078	15,067	329,083	7,169,296
2030	572,566	211,840	15,158	1,741	228,739	181,890	22,411	204,301	10,128,582	304,844	35,820	17,747	358,411	9,770,171
2035	777,698	258,475	17,348	1,609	277,432	208,176	24,468	232,644	13,762,845	321,017	40,078	21,129	382,224	13,380,622
2040	1,059,646	316,982	20,236	1,686	338,904	242,837	26,675	269,512	18,756,437	328,533	46,129	25,034	399,696	18,356,742
2045	1,446,793	387,234	23,313	1,791	412,338	279,758	28,044	307,802	25,613,913	330,649	53,153	29,346	413,148	25,200,766
2050	1,979,113	470,822	26,361	1,818	499,001	316,333	28,120	344,453	35,043,623	330,368	60,072	34,230	424,670	34,618,954

VI- Conclusions

A- Surplus
The surplus is very large as at 31 March 1996, whether expressed absolutely ($1,032.6 million) or as a multiple (11.6) of the estimated benefit payments for plan year 1997.

The participants' and government's contributions projected for 1997 and future plan years (even if until plan year 2024 they are lower than the projected benefit payments), together with projected investment earnings, cause the projected surplus to continue to increase in each future year.

Consequently, it would be appropriate to take measures now to reduce the surplus in the Public Service Death Benefit Account over time. However, the statutes governing the operation of the plan are silent on this matter.

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

- the valuation data on which it is based are sufficient and reliable;
- the assumptions that have been used are, in aggregate, appropriate;
- the methodology employed is appropriate; and
- the value of the plan assets would be greater than the liabilities if the plan were to be wound up at the valuation date.

This report has been prepared, and my opinion given, in accordance with accepted actuarial practice, and particularly with the Recommendations of the Canadian Institute of Actuaries for Actuarial Advice given with respect to Self-Insured Employee Benefit Plans.

Bernard Dussault, B.Sc., F.S.A., F.C.I.A.   Ottawa, Canada
Chief Actuary   27 February 1998
Public Insurance and Pension Programs

APPENDIX 1

Summary of Plan Provisions

Following is a summary description of the main provisions of the life insurance plan established for the members of the Public Service of Canada under Part II - *Supplementary Death Benefit* of the *Public Service Superannuation Act* (PSSA). This plan supplements the pension plan covering the members of the Public Service by providing a lump sum benefit upon the death of an insured member.

A- Membership

1. **Non-Elective Participants**
   Non-elective participants include all contributors to the pension plan established under the PSSA who are employed in the Public Service except:

   a) employees of Crown corporations who are excluded by regulation from Part II of the PSSA (they are covered under other group life insurance plans), and
   b) contributors who elected not to join the SDB plan when it was implemented in 1955.

2. **Elective Participants**
   Elective participants means all participants who have ceased to be employed in the Public Service following disability or retirement and have opted for continuing their coverage under the SDB plan. Such right is limited to participants who, at the time they ceased to be employed in the Public Service, had completed at least two years of continuous service in the Public Service or two years of membership in the SDB plan.

   Elective participants in receipt of an immediate annuity under the PSSA upon cessation of employment are assumed to be covered unless they elect otherwise. However, elective participants in receipt of an annual allowance (i.e. reduced annuity as defined by the PSSA actuarial report) or a deferred annuity must elect to continue their full coverage under the SDB to continue their membership in the plan. These elections must be made within the 13-month period running from one year before, to the 30th day following, cessation of employment. The insured death benefit is extended for 30 days after the date of cessation whether or not the participant exercises the right of election.

B-   Assets

The plan is financed through the PSDB Account, which forms part of the Public Accounts of Canada. The Account is credited with all contributions made by the participants and the government, and charged with all benefit payments when they become due. The Account is also credited with investment earnings at the projected investment yields applying to the Public Service Superannuation Account. No formal debt instrument is issued by the government to the PSDB Account in recognition of the amounts therein.

C-   Contributions

1. **Non-Elective Participants, and Elective Participants in Receipt of an Immediate Annuity or an Annual Allowance**

    For non-elective participants and elective participants in receipt of an immediate annuity (disability or retirement) or an annual allowance on termination of employment in the Public Service, the rate of contribution is $0.05 per month for each $250 of insured benefit. When these participants attain age 65 (or completes two years of service, if later), their contribution is reduced by $1.00 per month in recognition of the fact that $5,000 of insured death benefit becomes paid-up (by the government) for the remaining lifetime of the participant.

2. **Elective Participants Entitled to a Deferred Annuity**

    For elective participants entitled to a deferred annuity, the legislated contribution rate varies in accordance with the attained age of the participant, and the corresponding contributions start being chargeable on the 30th day immediately following cessation of employment. The table below shows the legislated rates for selected ages:

Age Last Birthday	Contribution per $2,000 of Insured Benefit	
	Annual	Monthly
25	$9.70	$0.82
30	11.42	0.97
35	13.58	1.15
40	16.29	1.39
45	19.72	1.67
50	24.11	2.05
55	29.80	2.53
60	37.65	3.20

3. Government

(a) Term Insurance

The government credits monthly to the PSDB Account an amount equal to one-twelfth of the total amount of death benefits actually payable (excluding the individual $5,000 paid-up portions of insured benefits) in respect of all participants deceasing during that month. Crown corporations and public boards whose employees are participants contribute at the rate of $0.01 per month for each $250 of insured benefit.

(b) Paid-Up Insurance

When a participant, other than one entitled to a deferred annuity or an annual allowance, reaches age 65 (or completes two years of service, if later), the government credits to the PSDB Account a single premium for the individual $5,000 paid-up portion of insured benefit in respect of which contributions are no longer required from the participant.

The legislated amount of single premium for each such $5,000 paid-up portion of insured benefit is shown in the following table and corresponds to one-tenth of $5,000 times the single premium rate for each dollar of insured benefit, computed on the basis of the Life Tables, Canada, 1950-1952 and interest at 4% per annum.

Age Last Birthday	Single Premium per $5,000 of Insured Benefit	
	Males	Females
65	$310	$291
66	316	298
67	323	306
68	329	313
69	336	320
70	343	328
71	349	335
72	356	342
73	362	349
74	369	356
75	375	363

(c) Cash Shortfalls

Under the statutes, if for whatever reason the PSDB Account were to become exhausted, the government would then have to make special contributions to the Account in an amount at least equal to the benefits then due but not paid by reason of such cash shortfall.

D-   Investment Earnings

Investment earnings are credited every three months to the PSDB Account at a rate of return equal to the average yield applying for the corresponding period to the combined Superannuation Accounts of the Public Service, Canadian Forces, and Royal Canadian Mounted Police pension plans. The investment portfolio underlying those three Accounts consists of notional bonds bearing interest as under the Canada Pension Plan, i.e. at the average rate on outstanding Government of Canada bonds with 20 or more years to maturity.

E-   Amount of Insured Death Benefit

Subject to the applicable reductions described below, the lump sum benefit payable upon the death of a participant is equal to the participant's current salary multiplied by two, the result being rounded to the next higher multiple of $250 if not already equal to such a multiple. For this purpose, the current salary of an elective participant is defined as the annual rate of pay at the time of cessation of employment in the Public Service.

The amount of insurance described above is reduced by 10% a year starting at age 61 until it would normally vanish at age 70. However, the amount of insurance cannot at any time be reduced below a basic floor value of $5,000 subject to the following exceptions:

1. For those elective participants who had, upon cessation of employment prior to the enactment of Bill C-55, made an election to reduce their insured death benefit to $500 and further had made a second election, within one year following the introduction of Bill C-55, to keep their insured death benefit at $500, the floor value is $500 instead of $5,000. Such election is irrevocable.

2. For non-elective participants, the amount of insurance cannot be reduced below the multiple, of $250 equal to or next above one-third of the participant's annual salary, even if the resulting amount is higher than $5,000.

3. For elective participants entitled to a deferred annuity or in receipt of an annual allowance, there is no coverage over age 70.

Upon ceasing to be employed in the Public Service, elective participants in receipt of an immediate annuity under the PSSA may opt to reduce their amount of insured death benefit to $5,000.

APPENDIX 2

Sample Demographic Assumptions

Table 2A

Assumed Seniority and Promotional Salary Increases

Service[1]	Male (%)	Female (%)
0	4.95	5.80
1	4.25	5.00
2	3.60	4.25
3	3.05	3.55
4	2.55	2.95
5	2.15	2.50
6	1.90	2.15
7	1.70	1.90
8	1.55	1.75
9	1.45	1.65
10	1.35	1.55
11	1.25	1.45
12	1.20	1.40
13	1.15	1.35
14	1.10	1.30
15	1.05	1.25
16	1.00	1.20
17	1.00	1.15
18	0.95	1.10
19	0.90	1.05
20	0.90	1.00
21	0.90	1.00
22	0.85	0.95
23	0.80	0.90
24	0.80	0.90
25	0.80	0.90
26	0.80	0.90
27	0.80	0.85
28	0.80	0.80
29	0.80	0.80
30	0.80	0.80
31	0.85	0.80
32	0.90	0.80
33	0.90	0.80
34	0.95	0.85
35	1.00	0.90
36	1.00	0.90
37	1.05	0.90
38+	1.10	0.90

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

Table 2B

Assumed Rates of Termination without Right to a Pension

	Main Group		ATC[1] and CSC[1] (o/s)	
Service[2]	Male	Female	Male	Female
0	0.180	0.200	0.135	0.150

Table 2C

Assumed Rates of Termination (for Reasons Other than Disability and Death) Prior to Age 50 with Right to a Pension

	Main Group		ATC[1] and CSC[1] (o/s)	
Service[2]	Male	Female	Male	Female
1	0.105	0.125	0.079	0.094
2	0.080	0.090	0.060	0.068
3	0.065	0.072	0.049	0.054
4	0.055	0.062	0.041	0.047
5	0.046	0.055	0.035	0.041
6	0.040	0.049	0.030	0.037
7	0.035	0.044	0.026	0.033
8	0.031	0.040	0.023	0.030
9	0.027	0.036	0.020	0.027
10	0.023	0.033	0.017	0.025
11	0.020	0.030	0.015	0.023
12 -18	0.014	0.025	0.011	0.019
19+	0.014	0.025	0.014	0.025

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[1]   Air Traffic Controllers and Correctional Services Canada in operational service.

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

Table 2D

Assumed Rates of Retirement (for Reasons Other than Disability and Death) at Age 50 and Over with Right to a Pension Male Members - Main Group

Select from 1 April 1996 to 31 March 1998

	Service[1]												
Age[1]	1-3	4-8	9-13	14-18	19-23	24-28	29	30	31	32	33	34	35+
49	0.080	0.030	0.110	0.115	0.115	0.125	0.140	0.150	0.150	0.150	0.160	0.220	0.200
50	0.080	0.030	0.110	0.120	0.120	0.130	0.145	0.155	0.155	0.160	0.165	0.240	0.200
51	0.080	0.030	0.110	0.120	0.125	0.135	0.165	0.165	0.165	0.175	0.185	0.240	0.240
52	0.080	0.030	0.110	0.120	0.125	0.140	0.170	0.170	0.180	0.190	0.220	0.270	0.270
53	0.080	0.030	0.110	0.120	0.125	0.145	0.180	0.200	0.220	0.220	0.250	0.300	0.300
54	0.100	0.040	0.110	0.120	0.125	0.145	0.270	0.270	0.270	0.350	0.350	0.600	0.550
55	0.120	0.060	0.110	0.120	0.125	0.140	0.250	0.250	0.250	0.270	0.320	0.550	0.500
56	0.120	0.060	0.110	0.120	0.130	0.140	0.250	0.250	0.250	0.270	0.320	0.500	0.450
57	0.140	0.080	0.110	0.120	0.130	0.140	0.250	0.250	0.250	0.270	0.320	0.500	0.450
58	0.140	0.080	0.120	0.130	0.140	0.150	0.250	0.250	0.250	0.270	0.320	0.500	0.450
59	0.190	0.190	0.210	0.210	0.210	0.310	0.410	0.410	0.410	0.370	0.350	0.600	0.500
60	0.190	0.190	0.210	0.210	0.210	0.310	0.350	0.350	0.370	0.340	0.320	0.550	0.450
61	0.180	0.180	0.180	0.180	0.220	0.280	0.310	0.310	0.310	0.310	0.310	0.500	0.410
62	0.200	0.200	0.200	0.200	0.240	0.280	0.340	0.360	0.380	0.380	0.380	0.500	0.410
63	0.250	0.250	0.250	0.250	0.270	0.310	0.350	0.350	0.370	0.370	0.370	0.600	0.480
64	0.500	0.500	0.500	0.500	0.600	0.600	0.600	0.600	0.650	0.650	0.650	0.700	0.600
65	0.400	0.400	0.400	0.400	0.450	0.450	0.500	0.500	0.500	0.500	0.500	0.650	0.480
66	0.400	0.400	0.400	0.400	0.400	0.400	0.500	0.500	0.500	0.500	0.500	0.650	0.480
67	0.400	0.400	0.400	0.400	0.400	0.400	0.500	0.500	0.500	0.500	0.500	0.650	0.480
68	0.400	0.400	0.400	0.400	0.400	0.400	0.500	0.500	0.500	0.500	0.500	0.650	0.480
69	0.400	0.400	0.400	0.400	0.400	0.400	0.500	0.500	0.500	0.500	0.500	0.650	0.480

Ultimate

	Service[1]												
Age[1]	1-3	4-8	9-13	14-18	19-23	24-28	29	30	31	32	33	34	35+
49	0.080	0.030	0.020	0.015	0.015	0.025	0.040	0.050	0.050	0.050	0.060	0.120	0.100
50	0.080	0.030	0.020	0.015	0.015	0.030	0.045	0.055	0.055	0.060	0.065	0.140	0.100
51	0.080	0.030	0.020	0.015	0.015	0.035	0.065	0.065	0.065	0.075	0.085	0.140	0.140
52	0.080	0.030	0.020	0.015	0.015	0.040	0.070	0.070	0.080	0.090	0.120	0.170	0.170
53	0.080	0.030	0.020	0.020	0.015	0.045	0.080	0.100	0.120	0.120	0.150	0.200	0.200
54	0.100	0.040	0.020	0.020	0.020	0.045	0.270	0.270	0.270	0.350	0.350	0.600	0.550
55	0.120	0.060	0.020	0.025	0.020	0.040	0.250	0.250	0.250	0.270	0.320	0.550	0.500
56	0.120	0.060	0.030	0.025	0.020	0.040	0.250	0.250	0.250	0.270	0.320	0.500	0.450
57	0.140	0.080	0.040	0.025	0.025	0.045	0.250	0.250	0.250	0.270	0.320	0.500	0.450
58	0.140	0.080	0.040	0.035	0.035	0.050	0.250	0.250	0.250	0.270	0.320	0.500	0.450
59	0.190	0.190	0.210	0.210	0.210	0.310	0.410	0.410	0.410	0.370	0.350	0.600	0.500
60	0.190	0.190	0.210	0.210	0.210	0.310	0.350	0.350	0.370	0.340	0.320	0.550	0.450
61	0.180	0.180	0.180	0.180	0.220	0.280	0.310	0.310	0.310	0.310	0.310	0.500	0.410
62	0.200	0.200	0.200	0.200	0.240	0.280	0.340	0.360	0.380	0.380	0.380	0.500	0.410
63	0.250	0.250	0.250	0.250	0.270	0.310	0.350	0.350	0.370	0.370	0.370	0.600	0.480
64	0.500	0.500	0.500	0.500	0.600	0.600	0.600	0.600	0.650	0.650	0.650	0.700	0.600
65	0.400	0.400	0.400	0.400	0.450	0.450	0.500	0.500	0.500	0.500	0.500	0.650	0.480
66	0.400	0.400	0.400	0.400	0.400	0.400	0.500	0.500	0.500	0.500	0.500	0.650	0.480
67	0.400	0.400	0.400	0.400	0.400	0.400	0.500	0.500	0.500	0.500	0.500	0.650	0.480
68	0.400	0.400	0.400	0.400	0.400	0.400	0.500	0.500	0.500	0.500	0.500	0.650	0.480
69	0.400	0.400	0.400	0.400	0.400	0.400	0.500	0.500	0.500	0.500	0.500	0.650	0.480

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

Table 2E

Assumed Rates of Retirement (for Reasons Other than Disability and Death) at Age 50 and Over with Right to a Pension Female Members - Main Group

Select from 1 April 1996 to 31 March 1998

							Service[1]						
Age[1]	1-3	4-8	9-13	14-18	19-23	24-28	29	30	31	32	33	34	35+
49	0.100	0.040	0.120	0.130	0.135	0.140	0.160	0.160	0.160	0.165	0.170	0.240	0.210
50	0.120	0.045	0.120	0.130	0.135	0.140	0.170	0.170	0.170	0.175	0.180	0.250	0.220
51	0.120	0.045	0.120	0.130	0.135	0.140	0.170	0.180	0.180	0.185	0.190	0.260	0.230
52	0.120	0.045	0.120	0.130	0.140	0.150	0.170	0.180	0.180	0.185	0.190	0.260	0.230
53	0.120	0.045	0.120	0.130	0.140	0.155	0.190	0.190	0.190	0.195	0.200	0.300	0.260
54	0.130	0.050	0.120	0.130	0.140	0.170	0.300	0.300	0.300	0.300	0.300	0.600	0.450
55	0.140	0.055	0.130	0.140	0.150	0.180	0.270	0.270	0.270	0.270	0.230	0.500	0.400
56	0.140	0.055	0.130	0.140	0.150	0.180	0.270	0.270	0.270	0.270	0.230	0.500	0.400
57	0.140	0.055	0.130	0.140	0.150	0.180	0.270	0.270	0.270	0.270	0.230	0.500	0.400
58	0.140	0.060	0.140	0.150	0.160	0.190	0.300	0.300	0.300	0.300	0.260	0.500	0.400
59	0.150	0.150	0.200	0.230	0.290	0.360	0.380	0.380	0.380	0.380	0.300	0.640	0.440
60	0.150	0.150	0.200	0.230	0.290	0.330	0.330	0.330	0.330	0.330	0.330	0.580	0.350
61	0.150	0.150	0.200	0.230	0.290	0.330	0.330	0.330	0.330	0.330	0.330	0.580	0.350
62	0.150	0.150	0.200	0.230	0.290	0.330	0.330	0.330	0.330	0.330	0.330	0.580	0.350
63	0.150	0.150	0.200	0.230	0.290	0.330	0.330	0.330	0.330	0.330	0.330	0.580	0.350
64	0.500	0.500	0.600	0.600	0.600	0.600	0.600	0.600	0.600	0.600	0.600	0.700	0.500
65	0.400	0.400	0.400	0.400	0.420	0.420	0.480	0.480	0.480	0.480	0.480	0.600	0.480
66	0.300	0.300	0.350	0.350	0.350	0.350	0.350	0.350	0.400	0.400	0.400	0.600	0.400
67	0.300	0.300	0.350	0.350	0.350	0.350	0.350	0.350	0.400	0.400	0.400	0.600	0.400
68	0.300	0.300	0.350	0.350	0.350	0.350	0.350	0.350	0.400	0.400	0.400	0.600	0.400
69	0.300	0.300	0.350	0.350	0.350	0.350	0.350	0.350	0.400	0.400	0.400	0.600	0.400

Ultimate

							Service[1]						
Age[1]	1-3	4-8	9-13	14-18	19-23	24-28	29	30	31	32	33	34	35+
49	0.100	0.040	0.030	0.030	0.025	0.040	0.060	0.060	0.060	0.065	0.070	0.140	0.110
50	0.120	0.045	0.035	0.035	0.025	0.040	0.070	0.070	0.070	0.075	0.080	0.150	0.120
51	0.120	0.045	0.035	0.035	0.025	0.040	0.070	0.080	0.080	0.085	0.090	0.160	0.130
52	0.120	0.045	0.035	0.035	0.030	0.050	0.070	0.080	0.080	0.085	0.090	0.160	0.130
53	0.120	0.045	0.035	0.035	0.035	0.055	0.090	0.090	0.090	0.095	0.100	0.200	0.160
54	0.130	0.050	0.040	0.040	0.040	0.070	0.300	0.300	0.300	0.300	0.300	0.600	0.450
55	0.140	0.055	0.050	0.050	0.050	0.080	0.270	0.270	0.270	0.270	0.230	0.500	0.400
56	0.140	0.055	0.050	0.050	0.050	0.080	0.270	0.270	0.270	0.270	0.230	0.500	0.400
57	0.140	0.055	0.050	0.050	0.050	0.080	0.270	0.270	0.270	0.270	0.230	0.500	0.400
58	0.140	0.060	0.060	0.060	0.060	0.090	0.300	0.300	0.300	0.300	0.260	0.500	0.400
59	0.150	0.150	0.200	0.230	0.290	0.360	0.380	0.380	0.380	0.380	0.300	0.640	0.440
60	0.150	0.150	0.200	0.230	0.290	0.330	0.330	0.330	0.330	0.330	0.330	0.580	0.350
61	0.150	0.150	0.200	0.230	0.290	0.330	0.330	0.330	0.330	0.330	0.330	0.580	0.350
62	0.150	0.150	0.200	0.230	0.290	0.330	0.330	0.330	0.330	0.330	0.330	0.580	0.350
63	0.150	0.150	0.200	0.230	0.290	0.330	0.330	0.330	0.330	0.330	0.330	0.580	0.350
64	0.500	0.500	0.600	0.600	0.600	0.600	0.600	0.600	0.600	0.600	0.600	0.700	0.500
65	0.400	0.400	0.400	0.400	0.420	0.420	0.480	0.480	0.480	0.480	0.480	0.600	0.480
66	0.300	0.300	0.350	0.350	0.350	0.350	0.350	0.350	0.400	0.400	0.400	0.600	0.400
67	0.300	0.300	0.350	0.350	0.350	0.350	0.350	0.350	0.400	0.400	0.400	0.600	0.400
68	0.300	0.300	0.350	0.350	0.350	0.350	0.350	0.350	0.400	0.400	0.400	0.600	0.400
69	0.300	0.300	0.350	0.350	0.350	0.350	0.350	0.350	0.400	0.400	0.400	0.600	0.400

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

Table 2F

Assumed Rates of Retirement (for Reasons Other than Disability and Death) at Age 50 and Over with Right to a Pension ATC and CSC Members in Operational Service

Male Members

	Service[1]												
Age[1]	1-3	4-8	9-13	14-18	19-23	24-28	29	30	31	32	33	34	35+
49	0.060	0.025	0.015	0.011	0.015	0.050	0.080	0.080	0.080	0.080	0.080	0.190	0.170
50	0.060	0.025	0.015	0.011	0.015	0.060	0.080	0.080	0.080	0.080	0.080	0.190	0.170
51	0.060	0.025	0.015	0.011	0.020	0.070	0.090	0.090	0.090	0.090	0.090	0.190	0.170
52	0.060	0.025	0.015	0.011	0.020	0.080	0.120	0.120	0.120	0.120	0.120	0.190	0.170
53	0.060	0.025	0.015	0.011	0.030	0.100	0.150	0.150	0.150	0.150	0.150	0.255	0.185
54	0.080	0.040	0.020	0.020	0.050	0.125	0.240	0.240	0.240	0.240	0.240	0.650	0.550
55	0.090	0.060	0.020	0.025	0.060	0.145	0.320	0.320	0.320	0.320	0.320	0.650	0.550
56	0.090	0.060	0.030	0.025	0.060	0.160	0.320	0.320	0.320	0.320	0.320	0.650	0.550
57	0.110	0.080	0.040	0.025	0.070	0.170	0.320	0.320	0.320	0.320	0.320	0.650	0.550
58	0.110	0.080	0.040	0.035	0.070	0.185	0.320	0.320	0.320	0.320	0.320	0.650	0.550
59	0.190	0.190	0.210	0.210	0.210	0.310	0.410	0.410	0.410	0.370	0.350	0.600	0.500
60	0.190	0.190	0.210	0.210	0.210	0.310	0.350	0.350	0.370	0.340	0.320	0.550	0.450
61	0.180	0.180	0.180	0.180	0.220	0.280	0.310	0.310	0.310	0.310	0.310	0.500	0.410
62	0.200	0.200	0.200	0.200	0.240	0.280	0.340	0.360	0.380	0.380	0.380	0.500	0.410
63	0.250	0.250	0.250	0.250	0.270	0.310	0.350	0.350	0.370	0.370	0.370	0.600	0.480
64	0.500	0.500	0.500	0.500	0.600	0.600	0.600	0.600	0.650	0.650	0.650	0.700	0.600
65	0.400	0.400	0.400	0.400	0.450	0.450	0.500	0.500	0.500	0.500	0.500	0.650	0.480
66	0.400	0.400	0.400	0.400	0.400	0.400	0.500	0.500	0.500	0.500	0.500	0.650	0.480
67	0.400	0.400	0.400	0.400	0.400	0.400	0.500	0.500	0.500	0.500	0.500	0.650	0.480
68	0.400	0.400	0.400	0.400	0.400	0.400	0.500	0.500	0.500	0.500	0.500	0.650	0.480
69	0.400	0.400	0.400	0.400	0.400	0.400	0.500	0.500	0.500	0.500	0.500	0.650	0.480

Female Members

	Service[1]												
Age[1]	1-3	4-8	9-13	14-18	19-23	24-28	29	30	31	32	33	34	35+
49	0.090	0.035	0.025	0.019	0.025	0.050	0.080	0.080	0.080	0.080	0.080	0.190	0.170
50	0.090	0.035	0.025	0.019	0.025	0.060	0.080	0.080	0.080	0.080	0.080	0.190	0.170
51	0.090	0.035	0.025	0.019	0.025	0.070	0.090	0.090	0.090	0.090	0.090	0.190	0.170
52	0.090	0.035	0.025	0.019	0.030	0.080	0.120	0.120	0.120	0.120	0.120	0.190	0.170
53	0.090	0.035	0.025	0.019	0.035	0.100	0.150	0.150	0.150	0.150	0.150	0.255	0.185
54	0.100	0.045	0.030	0.025	0.050	0.125	0.240	0.240	0.240	0.240	0.240	0.650	0.550
55	0.110	0.050	0.040	0.040	0.060	0.145	0.320	0.320	0.320	0.320	0.320	0.650	0.550
56	0.110	0.050	0.040	0.040	0.060	0.160	0.320	0.320	0.320	0.320	0.320	0.650	0.550
57	0.110	0.050	0.040	0.040	0.070	0.170	0.320	0.320	0.320	0.320	0.320	0.650	0.550
58	0.110	0.055	0.050	0.040	0.070	0.185	0.320	0.320	0.320	0.320	0.320	0.650	0.550
59	0.150	0.150	0.200	0.230	0.290	0.360	0.380	0.380	0.380	0.380	0.300	0.640	0.440
60	0.150	0.150	0.200	0.230	0.290	0.330	0.330	0.330	0.330	0.330	0.330	0.580	0.350
61	0.150	0.150	0.200	0.230	0.290	0.330	0.330	0.330	0.330	0.330	0.330	0.580	0.350
62	0.150	0.150	0.200	0.230	0.290	0.330	0.330	0.330	0.330	0.330	0.330	0.580	0.350
63	0.150	0.150	0.200	0.230	0.290	0.330	0.330	0.330	0.330	0.330	0.330	0.580	0.350
64	0.500	0.500	0.600	0.600	0.600	0.600	0.600	0.600	0.600	0.600	0.600	0.700	0.500
65	0.400	0.400	0.400	0.400	0.420	0.420	0.480	0.480	0.480	0.480	0.480	0.600	0.480
66	0.300	0.300	0.350	0.350	0.350	0.350	0.350	0.350	0.400	0.400	0.400	0.600	0.400
67	0.300	0.300	0.350	0.350	0.350	0.350	0.350	0.350	0.400	0.400	0.400	0.600	0.400
68	0.300	0.300	0.350	0.350	0.350	0.350	0.350	0.350	0.400	0.400	0.400	0.600	0.400
69	0.300	0.300	0.350	0.350	0.350	0.350	0.350	0.350	0.400	0.400	0.400	0.600	0.400

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

Table 2G

Assumed Rates of Termination with Right to a Disability Pension

Age[1]	Male	Female
21	0.0003	0.0000
22	0.0003	0.0000
23	0.0003	0.0001
24	0.0003	0.0002
25	0.0003	0.0002
26	0.0003	0.0003
27	0.0003	0.0003
28	0.0003	0.0004
29	0.0003	0.0004
30	0.0003	0.0004
31	0.0003	0.0005
32	0.0003	0.0005
33	0.0004	0.0005
34	0.0005	0.0006
35	0.0005	0.0006
36	0.0006	0.0007
37	0.0008	0.0008
38	0.0009	0.0009
39	0.0010	0.0010
40	0.0011	0.0012
41	0.0013	0.0014
42	0.0014	0.0016
43	0.0016	0.0019
44	0.0018	0.0023
45	0.0021	0.0028
46	0.0025	0.0033
47	0.0030	0.0039
48	0.0036	0.0047
49	0.0043	0.0055
50	0.0051	0.0064
51	0.0060	0.0074
52	0.0069	0.0084
53	0.0078	0.0094
54	0.0088	0.0104
55	0.0097	0.0114
56	0.0107	0.0123
57	0.0118	0.0132
58	0.0128	0.0140

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

Table 2H

Sample of Assumed Mortality Rates[1] for 1997 Plan Year

Age[2]	Non-Elective Participants and Elective Participants (other than disabled)		Elective Participants (disabled)	
	Male	Female	Male	Female
25	0.0005	0.0003	0.0064	0.0075
30	0.0007	0.0004	0.0095	0.0080
35	0.0009	0.0004	0.0126	0.0084
40	0.0012	0.0006	0.0155	0.0091
45	0.0017	0.0012	0.0185	0.0101
50	0.0025	0.0018	0.0214	0.0117
55	0.0042	0.0027	0.0241	0.0138
60	0.0087	0.0051	0.0291	0.0169
65	0.0163	0.0091	0.0395	0.0220
70	0.0275	0.0150	0.0570	0.0301
75	0.0456	0.0248	0.0756	0.0440
80	0.0750	0.0453	0.1009	0.0687
85	0.1156	0.0816	0.1413	0.1179
90	0.1754	0.1324	0.2124	0.1841
95	0.2584	0.1973	0.3193	0.2873
100	0.3585	0.3217	0.4801	0.4486
105	0.5335	0.5067	0.7217	0.7002
109	0.8834	0.8767	1.0000	1.0000
110	1.0000	1.0000	1.0000	1.0000

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[1]   See also table 2I for a sample of assumed longevity improvement factors.

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

Table 2I

Sample of Assumed Longevity Improvement Factors

Age[1]	Annual % Mortality Reduction	
	Male	Female
25	1.25	1.65
30	0.75	1.25
35	0.75	1.35
40	1.05	1.75
45	1.55	1.85
50	2.05	1.95
55	2.15	1.05
60	1.85	0.75
65	1.65	0.75
70	1.75	0.75
75	1.65	1.05
80	1.25	0.95
85	0.95	0.85
90	0.65	0.55
95	0.45	0.45
100	0.35	0.35
105	0.00	0.00
109	0.00	0.00

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

Table 2J

**Proportion of Members Electing SDB Coverage
at Retirement with an Immediate Annuity or Annual Allowance**

Age[1]	Male	Female
15 - 43	0.00	0.00
44 - 48	0.50	0.70
49	0.51	0.73
50	0.59	0.73
51	0.66	0.73
52	0.72	0.73
53	0.77	0.73
54	0.81	0.73
55	0.85	0.73
56	0.87	0.74
57	0.88	0.75
58	0.89	0.77
59	0.90	0.79
60	0.91	0.82
61	0.92	0.86
62	0.93	0.90
63	0.96	0.95
64+	1.00	1.00

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

APPENDIX 3

Summaries of Participants Data

Table 3A

Non-Elective Participants in Main Group as at 31 March 1996

Age Last Birthday	Number			Insured Benefits ($ thousands)		
	Male	Female	Total	Male	Female	Total
to 24	1,221	1,802	3,023	82,227	110,182	192,409
25-29	7,486	9,682	17,168	552,670	653,996	1,206,666
30-34	15,744	18,391	34,135	1,252,294	1,328,960	2,581,254
35-39	23,901	25,103	49,004	2,004,292	1,876,245	3,880,537
40-44	31,085	26,363	57,448	2,734,390	2,032,438	4,766,828
45-49	31,795	21,662	53,457	3,015,743	1,682,820	4,698,563
50-54	18,818	11,104	29,922	1,850,589	840,537	2,691,126
55-59	9,570	5,648	15,218	936,301	408,425	1,344,726
60-64	3,490	2,146	5,636	286,214	128,824	415,038
65-69	628	333	961	21,488	7,366	28,854
Total	143,738	122,234	265,972	12,736,208	9,069,793	21,806,001

Summary

	Male	Female	Total
Average Age Last Birthday	43.2	40.9	42.1
Average Completed Years of Service	14.1	11.0	12.7
Average Insured Benefit ($)	88,600	74,200	82,000

Table 3B

**Non-Elective ATC and CSC Participants
in Operational Service as at 31 March 1996**

Age Last Birthday	Number			Insured Benefits ($ thousands)		
	Male	Female	Total	Male	Female	Total
to 24	65	85	150	4,100	5,386	9,486
25-29	412	366	778	29,581	25,842	55,423
30-34	745	587	1,332	59,031	44,807	103,838
35-39	1,009	579	1,588	84,557	45,821	130,378
40-44	1,188	371	1,559	104,183	30,722	134,905
45-49	944	167	1,111	85,193	13,508	98,701
50-54	527	49	576	48,803	4,297	53,100
55-59	150	11	161	13,807	995	14,802
60-64	9	1	10	731	61	792
Total	5,049	2,216	7,265	429,986	171,439	601,425

Summary

	Male	Female	Total
Average Age Last Birthday	40.5	35.5	39.0
Average Completed Years of Service	14.4	8.8	12.7
Average Insured Benefit ($)	85,200	77,400	82,800

Table 3C

**Elective Disability Participants in Receipt of an Immediate Annuity
as at 31 March 1996**

Age Last Birthday	Number			Insured Benefits ($ thousands)		
	Male	Female	Total	Male	Female	Total
30-34	2	2	4	126	60	186
35-39	8	18	26	441	1,140	1,582
40-44	68	114	182	4,399	7,022	11,421
45-49	195	270	465	14,032	17,176	31,208
50-54	440	387	827	34,030	24,697	58,727
55-59	643	467	1,110	49,485	31,219	80,704
60-64	1,114	703	1,817	89,048	44,366	133,414
65-69	1,278	726	2,004	76,151	35,552	111,703
70-74	1,093	520	1,613	21,540	8,204	29,744
75-79	1,208	477	1,685	6,035	2,385	8,420
80-84	707	328	1,035	3,535	1,640	5,175
85-89	206	173	379	1,030	860	1,890
90-94	37	55	92	185	275	460
95-99	5	6	11	25	30	55
Total	7,004	4,246	11,250	300,062	174,626	474,689

Summary

	Male	Female	Total
Average Age Last Birthday	63.2	60.7	62.3
Average Insured Benefit ($)	42,800	41,100	42,200

Table 3D

**Elective Retirement Participants in Receipt of an Immediate Annuity
as at 31 March 1996**

Age Last Birthday	Number			Insured Benefits ($ thousands)		
	Male	Female	Total	Male	Female	Total
30-34	0	1	1	0	153	153
35-39	0	0	0	0	0	0
40-44	1	0	1	160	0	160
45-49	7	1	8	991	253	1,245
50-54	46	9	55	7,791	1,140	8,930
55-59	3,763	741	4,504	404,935	63,296	468,231
60-64	10,778	3,152	13,930	873,852	174,953	1,048,805
65-69	14,630	4,922	19,552	431,339	101,051	532,389
70-74	18,141	5,781	23,922	90,705	28,905	119,610
75-79	13,354	4,141	17,495	66,770	20,705	87,475
80-84	6,825	2,679	9,504	34,120	13,395	47,515
85-89	2,381	1,335	3,716	11,900	6,670	18,570
90-94	619	433	1,052	3,095	2,165	5,260
95-99	114	95	209	570	475	1,045
100-104	21	21	42	105	105	210
Total	70,680	23,311	93,991	1,926,333	413,266	2,339,598

Summary

	Male	Female	Total
Average Age Last Birthday	71.2	72.5	71.5
Average Insured Benefit ($)	27,300	17,700	24,900

Table 3E

Elective Participants in Receipt of an Annual Allowance as at 31 March 1996

Age Last Birthday	Number			Insured Benefits ($ thousands)		
	Male	Female	Total	Male	Female	Total
35-39	1	0	1	223	0	223
40-44	2	3	5	288	583	871
45-49	72	58	130	13,675	9,114	22,789
50-54	2,970	1,563	4,533	347,063	135,546	482,610
55-59	1,550	982	2,532	184,104	74,942	259,046
60-64	141	77	218	16,829	5,018	21,847
65-69	27	12	39	847	215	1,062
Total	4,763	2,695	7,458	563,029	225,418	788,448

Summary

	Male	Female	Total
Average Age Last Birthday	53.9	54.0	53.9
Average Insured Benefit ($)	118,200	83,600	105,700

Table 3F

Elective Participants[1] Entitled to a Deferred Annuity as at 31 March 1996

Number	Insured Benefits ($ thousands)
23	1,369

[1] Were disregarded for valuation purposes.