

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

**Regular Force
Death Benefit Account
Actuarial Report**

as at December 31, 1987

Canada

REGULAR FORCE DEATH BENEFIT ACCOUNT

ACTUARIAL REPORT

AS AT DECEMBER 31, 1987

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Canadian Forces Superannuation Act - Part II

Report on Actuarial Examination of the Regular Force Death Benefit Account in the Consolidated Revenue Fund as at December 31, 1987

I. Summary

Pursuant to section 71 of the Canadian Forces Superannuation Act, we have completed an actuarial examination of the Regular Force Death Benefit Account in the Consolidated Revenue Fund as at December 31, 1987. At that date the total benefit coverage for all participants was approximately \$3.44 billion.

The current average cost for non-elective* and elective* participants combined is estimated to be approximately \$0.22 per month per \$1,000 benefit. The government contributes one-sixth of this cost or about \$0.04 per month, while participants are required by statute to contribute \$0.20 per month. The average monthly cost per \$1,000 benefit is expected to decrease gradually with some fluctuations to an ultimate cost of approximately \$0.16 by the year 2050. The changes in estimated costs arise primarily from projected changes in the age composition of the insured population and the use of projected mortality for elective participants. "Projected mortality" means that rates of mortality at various ages in future years are progressively lower than the corresponding rates at the present time, reflecting expected increases in longevity.

The contribution stabilization reserve in the Regular Force Death Benefit Account was \$79.0 million as at December 31, 1987, or about 8.5 times the expected amount of benefits payable from the Account in 1988. This was up from \$48.7 million as at December 31, 1983, or about 5.8 times the expected amount of benefits payable from the Account in 1984. Without any changes in the benefit and financing provisions of the Plan, the income (excluding interest) is expected to exceed charges indefinitely. The contribution stabilization reserve under these circumstances is expected to continue to grow and to be substantially more than adequate to cushion adverse experience fluctuations.

Section II of this report presents a summary of the membership data. Section III sets out the estimated monthly cost of benefits subject to uniform contributions, both currently and in the long term. Section IV presents the balance sheet for the Account as at December 31, 1987, as well as some contribution stabilization reserve projections. Section V acknowledges the co-operation of the various providers of the data. Section VI contains the actuarial opinion regarding the data, the actuarial assumptions and the actuarial method upon which this report is based. The actuarial assumptions entering into the calculations are described in Appendix 1; a number of the assumptions are tabulated in Appendices 2A through 2G. A summary of the terms of the plan is provided in Appendix 3.

* See Appendix 3 for definitions.

II. Data

Data for participants who were members of the forces (non-elective participants) on December 31, 1987 and for elective participants were provided by the Department of National Defence. The following schedule shows pertinent statistics (including paid-up coverage) derived from the data.

Participants as at December 31, 1987

<u>Class</u>	<u>Number</u>	<u>Total Benefit</u>	<u>Average Benefit</u>
<u>Non-Elective Participants</u>			
(a) Officers: Male	16,288	\$ 650,776,000	\$39,954
Female	1,569	48,612,750	30,983
(b) Other Ranks: Male	62,639	1,775,103,500	28,339
Female	6,645	175,399,250	26,396
Sub-Totals	<u>87,141</u>	<u>\$2,649,891,500</u>	<u>\$30,409</u>
<u>Elective Participants</u>			
(a) entitled to an immediate annuity under the Act			
Male	50,290	\$ 782,611,725	\$15,562
Female	348	7,218,350	20,742
(b) not entitled to an immediate annuity under the Act	115	1,108,000	9,635
Sub-Totals	<u>50,753</u>	<u>\$ 790,938,075</u>	<u>\$15,584</u>
Totals	<u>137,894</u>	<u>\$3,440,829,575</u>	<u>\$24,953</u>

III. Cost of Benefits Subject to Uniform Monthly Contributions

A. Current Cost

Non-elective participants and elective participants entitled to an immediate annuity on ceasing to be members of the regular force contribute to the Regular Force Death Benefit Account at a monthly rate of 20 cents per \$1,000 of benefit regardless of age (except for the 10 cents reduction after age sixty-five in respect of the \$500 of benefit paid-up by the government).

For these participants the benefit cost expected to be experienced in 1988 was estimated by applying the mortality rates described in Appendix 1 and displayed in appendices 2A, 2B and 2C to the benefit coverage of participants of the plan as at December 31, 1987. The results are shown in the following table:

<u>Current Cost per \$1,000 Benefit</u>	
<u>Class</u>	<u>Monthly Cost</u>
Non-elective participants	\$0.097
Elective participants entitled to an immediate annuity	\$0.618
Combined	\$0.217

These figures may be accepted as reflecting the total current average monthly cost, which is about 22 cents per \$1,000 benefit for non-elective participants and elective participants entitled to an immediate annuity combined. This level of cost is supported by statistics included in the published annual reports on the administration of the Canadian Forces Superannuation Act for the five years ending March 31, 1988. These indicate current average monthly claim payments per \$1,000 benefit coverage of between 19.6 cents and 24.3 cents.

Since monthly contributions from participants, together with government credits equal to one-sixth of benefits paid*, currently represent about 24 cents per \$1,000 benefit for these two classes of participants, contribution income is expected to exceed slightly benefit payments for a while and then to exceed them more substantially in the long-term as indicated in subsection B below. The effect this will have on the contribution stabilization reserve when interest is added as well is discussed in section IV.

* In respect of participants who at the time of death were contributing in respect of death benefits and were members of the forces or were entitled to an immediate annuity under Part I of the Act or the Defence Services Pension Continuation Act.

B. Long-Term Cost

Long-term benefit costs were estimated according to the valuation bases described in Appendix 1. They are shown in the following table:

Long-Term Cost (monthly) per \$1,000 Benefit

<u>Class</u>	<u>Calendar Year</u>				
	<u>1988</u>	<u>1995</u>	<u>2010</u>	<u>2025</u>	<u>2050</u>
Non-elective participants	\$0.097	\$0.094	\$0.109	\$0.101	\$0.103
Elective participants entitled to an immediate annuity	0.618	0.634	0.463	0.472	0.316
Combined	0.217	0.226	0.203	0.204	0.160

The assumed distributions of new entrants and rates of decrement (i.e., mortality, disability, retirement and termination) subject to the constraints imposed in the projection (constant non-elective populations within each sex/rank category), result in a projected aging of both the non-elective and elective participant populations as indicated by the following table. The average ages are calculated using amounts of insured benefit (excluding paid-up coverage) as weights.

<u>Category</u>	<u>Average Age</u>			
	<u>Non-elective</u>		<u>Elective</u>	
	<u>Current</u>	<u>Ultimate (2050)</u>	<u>Current</u>	<u>Ultimate (2050)</u>
Officers				
- male	36.99	38.82	55.16	56.73
- female	32.10	37.68	54.97	56.49
Other ranks				
- male	32.70	34.94	52.99	55.06
- female	29.12	34.75	48.16	55.36

Because it was assumed that the age-specific mortality rates of non-elective participants would not decrease with the passage of time, i.e., that the mortality rates in Appendix 2A will remain valid indefinitely, the projected aging of the non-elective participant population results in a slight projected increase in the monthly cost per \$1,000 benefit, from \$0.097 in 1988 to \$0.103 in 2050.

For elective participants entitled to an immediate annuity, it was assumed that the mortality rates for 1988 shown in Appendices 2B and 2C would decrease substantially with the passage of time in accordance with the projection factors of Appendix 2D. This more than offsets the aging effect and is the primary reason for the substantial decrease in the cost per \$1,000 benefit from \$0.618 in 1988 to \$0.316 in 2050. Another contributing factor is the increase in the proportion of female coverage to male coverage from 0.9% to 9%. (For non-elective participants, the increase was much less significant, from 8.5% to 9.4%.)

The estimated ultimate (2050) monthly cost for non-elective and elective participants combined is expected to be about 26.3% lower than the estimated current (1988) monthly cost. This change is the net result of:

- i) the change in the age distribution of the insured population noted in the preceding paragraphs resulting in an increase in the monthly cost of approximately 15.6%;
- ii) the change in the male/female distribution of the insured population resulting in a decrease in the monthly cost of approximately 4.9%;
- iii) use of projected mortality factors for the elective population resulting in a decrease in the monthly cost of approximately 45.2%; and
- iv) other factors, including the change in the proportion of total coverage on elective participants versus non-elective participants, resulting in an increase in the monthly cost of approximately 8.2%;

For purposes of our 1983 report, the ultimate monthly cost per \$1,000 benefit for non-elective and elective participants combined was estimated to be \$0.325. A reconciliation of the difference with the \$0.160 shown in this report is provided in the following table:

**Reconciliation of 1983 and 1987 Report
Estimates of Ultimate Monthly Costs**

Estimate of ultimate monthly cost from 1983 report :	\$0.325
Effect of:	
a) (i) changes in starting assumed mortality rates :	(0.062)
(ii) use of projection scale :	(0.095)
b) changes in other assumptions :	(0.009)
c) changes in methodology :	(0.001)
d) changes in population composition:	0.002
Estimate of ultimate monthly cost in this report:	<u>\$0.160</u>

IV. Balance Sheet and Contribution Stabilization Reserve Projection

The following balance sheet shows the state of the Regular Force Death Benefit Account as at December 31, 1987.

<u>Assets</u>	(in thousands)
Balance of Account	\$80,886
Due and accrued Government credits	94
Contributions due from participants	538
Interest due on Account	2,132
Total Assets	<u>\$83,650</u>
 <u>Liabilities</u>	
Actuarial present value of \$500 paid-up benefit for participants over age 64 who are entitled to an immediate annuity	\$ 3,218
Actuarial liability for elective participants not entitled to an immediate annuity	16
Reserve for claims incurred but unreported or reported but not paid	1,372
Total liabilities	<u>\$ 4,606</u>
Contribution stabilization reserve	<u>\$79,044</u>
	<u>\$83,650</u>

The contribution stabilization reserve of \$79.0 million shown above is equal to about 8.5 times the expected benefits payable from the Account in 1988. The following table illustrates the expected contribution stabilization reserves based a) on a continuation of the participant contribution rate of \$0.20 per month per \$1,000 benefit, and b) on a reduction of this rate to \$0.12 per month effective January 1, 1991, assuming in both cases that the government pays one-sixth of the associated benefits.

Assumed participant contribution rate per \$1,000 benefits after December 31, 1990	Projected ratio of contribution stabilization reserve to annual benefit payments in following year						
	<u>1988</u>	<u>1995</u>	<u>2010</u>	<u>2020</u>	<u>2030</u>	<u>2040</u>	<u>2050</u>
\$0.20	8.5	13.9	22.5	25.6	35.3	46.4	57.6
\$0.12	8.5	11.9	13.2	11.7	12.6	13.8	14.9

This table suggests that continuation of the existing plan will result in a grossly excessive contribution stabilization reserve. A reduction of the contribution rate to \$0.12 per \$1,000 benefit could be made while still maintaining a more than adequate reserve.

These forecasts are based on the assumption that there will be substantial reductions in elective participant mortality in the future, reductions that appear to be reasonable but are not certain of being fully realized. On the other hand, the assumptions do not provide any reduction in non-elective participant mortality, and there will almost certainly be reductions in these mortality rates as well. Consequently, it is likely that future contribution rates required will be somewhat lower than those estimated in this report. Under such circumstances serious consideration should be given to reviewing the contribution rates and/or amounts of coverage provided by such rates.

V. Acknowledgements

We wish to acknowledge the co-operation and able assistance of the various sections of the Department of National Defence that supplied us with the data used.

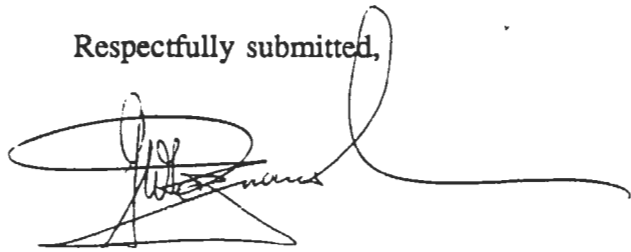
VI. Actuarial Opinion

In my opinion, for the purposes of this actuarial report:

- a) the data upon which the calculations have been based are sufficient and reliable,
- b) the assumptions used are reasonable and appropriate, and
- c) the methods employed are consistent with sound actuarial principles.

This report has been prepared and this opinion has been given in accordance with generally accepted actuarial principles and the Recommendations of the Canadian Institute of Actuaries.

Respectfully submitted,

A handwritten signature in black ink, appearing to read 'G.W. Poznanski', with a long horizontal flourish extending to the right.

G.W. Poznanski, F.S.A., F.C.I.A.
Chief Actuary

Ottawa, Canada

September 20, 1990

APPENDIX 1

Valuation Assumptions

A. Interest

Currently the Regular Force Death Benefit Account is credited quarterly with interest calculated on the balance in the Account in accordance with section 55 of the Canadian Forces Superannuation Regulations. The rates specified in the Regulations are the same as those at which interest credits in respect of the Canadian Forces Superannuation Account are calculated. These rates are based on notional investments of cash flow in long-term government securities similar to those prescribed for purposes of the Canada Pension Plan and they vary from quarter to quarter. The quarterly rates applicable to various portions of the balance in the Account during the calendar year 1987 were equivalent to an annual rate of approximately 11.14% per annum.

Actuarial liabilities play a minor role in the operation of this Account, and it was considered appropriate to estimate their value using an assumed rate of interest of 6% per annum. For the purpose of projecting the contribution stabilization reserve, interest credits were calculated in accordance with assumed fund yields developed for purposes of Appendix 1 to the Actuarial Report on the Canadian Forces Superannuation Account* as at December 31, 1987, which are as follows:

Interest Rates Assumed in Projection
of Contribution Stabilization Reserve

1988	11.1%	1996	9.1%	2004	6.9%
1989	10.1	1997	8.9	2005	6.7
1990	10.0	1998	8.6	2006	6.4
1991	10.0	1999	8.4	2007	6.3
1992	9.9	2000	8.1	2008	6.1
1993	9.8	2001	7.8	2009	6.0
1994	9.6	2002	7.4	2010	6.0
1995	9.4	2003	7.1	2011+	6.0

* See page 4 of that report.

B. Mortality

(1) Non-elective Participants

Active contributors under Part I of the Act (Superannuation) comprise a group largely identical to that of the non-elective participants under Part II (death benefit). We have, therefore, adopted for this valuation mortality rates assumed for purposes of the Actuarial Report on the Superannuation Account as at December 31, 1987. The rates are shown in Appendix 2A.

(2) Elective Participants Entitled to an Immediate Annuity

A large proportion of participants who became entitled to immediate annuities upon ceasing to be employed in the regular force between January 1, 1955 and July 4, 1960 did not become retired participants. This situation changed largely as the result of the 1960 amendments to the Act.

Since July 14, 1960, it has no longer been necessary for a participant who becomes an annuitant to take action to retain the death benefit coverage. In fact, the only action such participant may now take is to elect to reduce coverage to \$500.

For mortality purposes, this class of retired participants is divided into two separate groups, depending on whether participants become entitled to an immediate annuity under the Canadian Forces Superannuation Act because of disability or for other reasons.

For participants who retired with an immediate annuity entitlement for reasons other than disability, tables of rates were constructed for males, based on the 1984-87 Canadian Forces Superannuation experience, that were assumed to represent mortality in 1985. Mortality for females in 1985 is assumed to be represented by the 1983 GAM Table with a set-back in age of one year. A projection scale was then used to reflect the expected decreases in mortality in the years following 1985. The rates for the calendar year 1988 are shown in Appendix 2B and the projection factors in Appendix 2D.

For retired participants entitled to an immediate annuity because of disability, the approach was similar to the one described in the preceding paragraph. The mortality rates assumed applicable for 1985 were percentages of the rates according to the Canadian Life Tables 1980-82: 110% for retired officers and 140% for others. Mortality rates for the calendar year 1988 are shown in Appendix 2C and projection factors in Appendix 2D.

(3) Participants Entitled to \$500 Paid-Up Benefit Coverage

All participants entitled to the \$500 paid-up benefit coverage at age 65 or over are included in the group described in subsection (2). For purposes of determining the actuarial reserve in respect of the paid-up benefit, the same mortality rates were used as are described in that subsection.

(4) Elective Participants who do not Become Entitled to an Immediate Annuity on Ceasing to be Employed in the Regular Force

The mortality bases used to compute the actuarial reserve in respect of former participants who are contributing at commercial rates are the same as those described in subsection (2) for elective participants entitled to an immediate annuity because of disability. These rates are shown in Appendix 2C and the projection factors in Appendix 2D.

C. Other Assumptions

For purposes of the long-term projections, it was assumed that:

- (1) the distribution of non-elective participants by rank and sex will remain constant and the same as the distribution at December 31, 1987;
- (2) the age and relative salary distribution of new non-elective participants in each future year will be, respectively, the same as:
 - (a) the age distribution of persons who became contributors under Part I of the Act during the 1984-87 period;
 - (b) the relative salary distribution as at December 31, 1987 of those who became contributors under Part I during 1987 (see Appendices 2E and 2F).
- (3) participants will experience mortality in accordance with the bases described in Section B;
- (4) the probabilities of disability, retirement and "other termination" for non-elective participants will be the same as the corresponding probabilities assumed for purposes of the examination of the Canadian Forces Superannuation Account as at December 31, 1987;

- (5) the probability of a non-elective participant who, upon ceasing to be a member of the regular force, is entitled under Part I of the Act or under the Defence Services Pension Continuation Act to an immediate annuity, electing to reduce his or her coverage to the minimum (\$500) is 5% if the cause of release is disability and 15% if the cause of release is other than disability;
- (6) non-elective participants will receive promotional increases in salary from December 31, 1987, or from the date at which participation commences, if later, on the basis of the promotional salary scales used for purposes of the examination of the Canadian Forces Superannuation Account as at December 31, 1987 (see Appendix 2G);
- (7) in addition to promotional increases in salaries referred to in (6) above, economic increases in salaries are:
- | | |
|-------------------|----------------------------------------|
| 1988 - 1995(%) | 3.0, 4.4, 3.3, 3.2, 3.0, 3.0, 3.0, 4.0 |
| 1996 and later(%) | 5.0 |
- (8) non-elective participants who cease to be employed without entitlement to an immediate annuity and become elective participants will not be a source of significant gain or loss.

These assumptions are very broad but are believed to produce reasonably safe estimates of the cost of benefit coverage in the long term.

With regard to (8), it seems unlikely that more than a very small proportion of contributors who cease to be employed without entitlement to an immediate annuity will become or remain elective participants. This is because the death benefit coverage is not permanent insurance and has no cash or loan value. Moreover, contribution rates are not lower than could be obtained by healthy persons in the open market, and election is not automatic.

APPENDIX 2A

Rates of Mortality for Non-Elective Participants

<u>Age</u>	<u>Males</u>		<u>Females</u>
	<u>Officers</u>	<u>Other Ranks</u>	<u>Officers and Other Ranks</u>
17	.000360	.001147	.000192
18	.000450	.001360	.000192
19	.000530	.001445	.000212
20	.000600	.001445	.000253
21	.000660	.001419	.000304
22	.000720	.001317	.000354
23	.000780	.001130	.000415
24	.000840	.001020	.000446
25	.000890	.000977	.000466
26	.000950	.000943	.000467
27	.000990	.000884	.000467
28	.001030	.000858	.000467
29	.001060	.000833	.000467
30	.001060	.000807	.000478
31	.001050	.000765	.000498
32	.001020	.000705	.000498
33	.000980	.000739	.000519
34	.000940	.000756	.000529
35	.000900	.000807	.000550
36	.000870	.000918	.000561
37	.000840	.001105	.000571
38	.000820	.001275	.000602
39	.000810	.001368	.000633
40	.000820	.001411	.000685
41	.000850	.001428	.000746
42	.000920	.001470	.000819
43	.001020	.001564	.000901
44	.001160	.001725	.000994
45	.001330	.001946	.001098
46	.001520	.002236	.001202
47	.001710	.002567	.001316
48	.001900	.002916	.001462
49	.002080	.003264	.001598
50	.002260	.003587	.001756
51	.002460	.003859	.001925
52	.002690	.004097	.002094
53	.002970	.004343	.002317
54	.003300	.004649	.002530
55	.003670	.005032	.002798
56	.004070	.005508	.003078
57	.004500	.006069	.003381
58	.004950	.006706	.003719
59	.005440	.007437	.004072

APPENDIX 2B

Rates of Mortality for 1988 for Elective Participants
Entitled to an Immediate Annuity for Reasons
Other than Disability

Age	Males		Females	Age	Males		Females
	Officers	Other Ranks	Officers and Other Ranks		Officers	Other Ranks	Officers and Other Ranks
30	.000548	.000851	.000313	70	.022641	.035238	.010517
31	.000579	.000913	.000333	71	.025059	.038724	.011944
32	.000613	.000980	.000354	72	.028075	.042427	.013646
33	.000651	.001054	.000376	73	.031684	.046334	.015632
34	.000693	.001138	.000400	74	.035824	.050433	.017905
35	.000754	.001255	.000427	75	.040392	.054711	.020465
36	.000793	.001330	.000457	76	.045305	.059247	.023279
37	.000840	.001421	.000480	77	.050320	.063952	.026377
38	.000899	.001533	.000511	78	.055230	.068811	.029761
39	.000972	.001670	.000545	79	.059858	.073805	.033436
40	.001061	.002187	.000585	80	.067564	.078915	.037404
41	.001169	.002243	.000631	81	.074327	.083997	.041669
42	.001296	.002344	.000679	82	.081475	.089147	.046240
43	.001448	.002471	.000735	83	.088959	.094355	.051126
44	.001623	.002616	.000798	84	.096732	.103679	.056346
45	.001824	.002781	.000872	85	.105534	.112271	.061912
46	.002062	.002992	.000959	86	.114286	.121581	.067944
47	.002327	.003257	.001063	87	.123400	.131276	.074521
48	.002615	.003591	.001179	88	.133006	.141495	.082324
49	.002924	.004022	.001303	89	.143178	.152318	.089746
50	.003424	.004579	.001438	90	.155633	.163824	.099091
51	.003567	.005258	.001574	91	.167028	.175819	.109420
52	.003848	.006007	.001714	92	.178774	.188184	.120692
53	.004260	.006783	.001862	93	.190839	.200883	.133203
54	.004774	.007540	.002025	94	.205152	.215949	.147123
55	.005361	.008258	.002212	95	.224435	.232335	.162639
56	.005994	.008933	.002432	96	.238552	.246948	.180239
57	.006679	.009608	.002687	97	.253834	.262768	.199947
58	.007428	.010295	.002979	98	.270443	.279961	.220713
59	.008264	.010989	.003309	99	.288550	.298705	.243168
60	.009209	.013164	.003679	100	.312801	.319185	.268185
61	.010280	.014499	.004084	101	.334264	.341086	.295187
62	.011491	.015969	.004528	102	.357751	.365052	.325225
63	.012826	.017591	.005017	103	.385240	.393102	.358897
64	.014228	.019389	.005555	104	.418710	.427255	.395842
65	.015605	.021385	.006149	105	.469531	.469531	.438360
66	.016903	.023637	.006802				
67	.018086	.026139	.007528				
68	.019297	.028906	.008360				
69	.020746	.031941	.009343				

APPENDIX 2C

Rates of Mortality for 1988 for Elective Participants who are
a) In Receipt of an Immediate Annuity
because of Disability, or
b) Not Entitled to an Immediate Annuity

Age	Males		Females		Age	Males		Females	
	Officers	Other Ranks	Officers	Other Ranks		Officers	Other Ranks	Officers	Other Ranks
25	.001620	.002050	.000540	.000690	70	.041700	.053080	.021000	.026720
26	.001560	.001980	.000560	.000720	71	.045270	.057630	.023100	.029400
27	.001530	.001930	.000570	.000730	72	.049270	.062720	.025530	.032480
28	.001470	.001880	.000590	.000760	73	.053640	.068270	.028180	.035860
29	.001450	.001850	.000610	.000770	74	.058280	.074170	.031050	.039520
30	.001430	.001820	.000620	.000780	75	.063290	.080560	.034240	.043590
31	.001430	.001820	.000640	.000820	76	.068860	.087630	.037830	.048160
32	.001450	.001850	.000680	.000860	77	.074960	.095410	.042040	.053510
33	.001480	.001890	.000730	.000930	78	.081560	.103810	.046770	.059530
34	.001570	.001990	.000790	.001000	79	.088610	.112770	.051930	.066100
35	.001640	.002090	.000870	.001110	80	.096130	.122360	.057650	.073370
36	.001750	.002220	.000950	.001210	81	.104150	.132560	.063980	.081430
37	.001880	.002390	.001040	.001330	82	.112710	.143440	.071050	.090420
38	.002030	.002590	.001150	.001470	83	.121930	.155190	.078750	.100220
39	.002190	.002780	.001260	.001600	84	.131680	.167600	.087050	.110780
40	.002390	.003040	.001380	.001750	85	.142010	.180730	.096060	.122260
41	.002600	.003310	.001530	.001940	86	.153210	.194990	.105980	.134880
42	.002870	.003660	.001670	.002120	87	.165270	.210350	.116830	.148690
43	.003180	.004050	.001830	.002330	88	.177940	.226470	.128490	.163520
44	.003520	.004480	.002010	.002550	89	.191410	.243610	.140970	.179420
45	.003910	.004980	.002180	.002780	90	.205680	.261780	.154370	.196470
46	.004360	.005540	.002420	.003080	91	.220620	.280790	.168660	.214650
47	.004840	.006150	.002640	.003370	92	.236610	.301140	.184080	.234280
48	.005380	.006850	.002930	.003730	93	.243070	.309370	.189550	.241240
49	.005970	.007600	.003230	.004110	94	.239800	.305200	.185050	.235520
50	.006590	.008390	.003560	.004520	95	.242520	.308660	.186840	.237790
51	.007320	.009310	.003910	.004980	96	.267270	.340160	.212310	.270210
52	.008090	.010300	.004280	.005450	97	.329710	.419630	.277690	.353420
53	.008950	.011390	.004670	.005950	98	.452350	.575720	.408340	.519710
54	.009870	.012570	.005090	.006480	99	.625430	.795990	.593340	.755160
55	.010860	.013820	.005550	.007070	100	.817030	1.000000	.796380	1.000000
56	.011930	.015200	.006050	.007700	101	.991550	--	.976780	--
57	.013130	.016720	.006610	.008420	102	1.000000	--	1.000000	--
58	.014410	.018330	.007210	.009180					
59	.015760	.020070	.007830	.009960					
60	.017240	.021940	.008520	.010840					
61	.018860	.024020	.009260	.011750					
62	.020670	.026310	.010140	.012900					
63	.022660	.028830	.011120	.014150					
64	.024770	.031530	.012150	.015470					
65	.027060	.034450	.013300	.016930					
66	.029610	.037680	.014580	.018550					
67	.032370	.041200	.016010	.020390					
68	.035290	.044920	.017570	.022360					
69	.038380	.048840	.019210	.024450					

APPENDIX 2D

Projection Factors Assumed Applicable in 1986
and Later Years for Elective Participants Entitled
to an Immediate Annuity

Annual Reduction from Mortality Assumed to Exist in 1985
(as a Percentage)

<u>Age</u>	<u>Males</u>	<u>Females</u>	<u>Age</u>	<u>Males</u>	<u>Females</u>
25	0.10	0.50	75	1.00	1.00
30	0.50	0.75	76	0.95	1.00
35	0.75	1.25	77	0.90	1.00
40	1.00	1.75	78	0.85	1.00
45	1.50	1.75	79	0.80	1.00
50	1.50	1.50	80	0.75	1.00
51	1.45	1.50	81	0.75	1.00
52	1.40	1.50	82	0.75	1.00
53	1.35	1.50	83	0.75	1.00
54	1.30	1.50	84	0.75	1.00
55	1.25	1.50	85	0.75	1.00
56	1.25	1.45	86	0.70	0.95
57	1.25	1.40	87	0.65	0.90
58	1.25	1.35	88	0.60	0.85
59	1.25	1.30	89	0.55	0.80
60	1.25	1.25	90	0.50	0.75
61	1.25	1.25	91	0.45	0.70
62	1.25	1.25	92	0.40	0.65
63	1.25	1.25	93	0.35	0.60
64	1.25	1.25	94	0.30	0.55
65	1.25	1.25	95	0.25	0.50
66	1.20	1.25	96	0.20	0.40
67	1.15	1.25	97	0.15	0.30
68	1.10	1.25	98	0.10	0.20
69	1.05	1.25	99	0.05	0.10
70	1.00	1.25			
71	1.00	1.20			
72	1.00	1.15			
73	1.00	1.10			
74	1.00	1.05			

APPENDIX 2E

Assumptions Relating to Male New Entrants

<u>Age</u>	<u>Officers</u>		<u>Other Ranks</u>	
	<u>Distribution</u>	<u>Average Salary (\$)</u>	<u>Distribution</u>	<u>Average Salary (\$)</u>
17.5	.095201	9,358	.015967	12,893
18.5	.165916	9,712	.095092	13,051
19.5	.149070	10,396	.184940	13,239
20.5	.072478	12,819	.196561	13,630
21.5	.061704	13,549	.160470	13,852
22.5	.066210	16,598	.115782	14,110
23.5	.080509	20,735	.082857	14,481
24.5	.083643	21,456	.057820	15,138
25.5	.062096	21,760	.039633	15,379
26.5	.049167	22,385	.022108	16,461
27.5	.027620	22,855	.010298	18,383
28.5	.016454	23,762	.005196	19,631
29.5	.013712	26,500	.003118	21,617
30.5	.008423	28,404	.002221	22,532
31.5	.007052	31,132	.001512	24,062
32.5	.003918	32,129	.001417	25,384
33.5	.005681	33,639	.000756	27,120
34.5	.002547	35,149	.000614	27,120
35.5	.003525	36,659	.000378	27,120
36.5	.002351	38,169	.000189	27,120
37.5	.002351	39,678	.000189	27,120
38.5	.002351	41,187	.000189	27,120
39.5	.002351	42,696	.000189	27,120
40.5	.001959	42,696	.000189	27,120
41.5	.001959	42,696	.000189	27,120
42.5	.001567	42,696	.000189	27,120
43.5	.001567	42,696	.000189	27,120
44.5	.001567	42,696	.000189	27,120
45.5	.001567	42,696	.000189	27,120
46.5	.001371	43,250	.000236	27,120
47.5	.001371	44,500	.000189	27,120
48.5	.001371	46,000	.000189	27,120
49.5	.001371	47,520	.000189	27,120
50.5	--	--	.000283	27,120
51.5	--	--	.000142	27,120
52.5	--	--	.000142	27,120

Average Entry Age

Average Starting Salary

Officers
Other Ranks

22.5
21.6

\$16,276
\$14,096

APPENDIX 2F

Assumptions Relating to Female New Entrants

<u>Age</u>	<u>Officers</u>		<u>Other Ranks</u>	
	<u>Distribution</u>	<u>Average Salary</u> (<u>\$</u>)	<u>Distribution</u>	<u>Average Salary</u> (<u>\$</u>)
17.5	.080043	9,360	.007861	12,444
18.5	.197438	9,760	.066302	12,768
19.5	.132337	9,798	.152768	13,719
20.5	.050160	10,109	.188653	13,991
21.5	.061900	13,917	.156528	14,301
22.5	.081110	18,298	.119959	14,515
23.5	.097118	21,532	.098770	14,796
24.5	.075774	22,861	.065960	15,691
25.5	.053362	23,551	.052632	15,974
26.5	.040555	24,272	.033151	16,053
27.5	.035219	26,074	.018113	18,842
28.5	.016009	28,050	.010253	22,296
29.5	.020277	28,804	.008544	22,895
30.5	.014941	31,252	.006835	24,842
31.5	.005336	33,852	.003076	26,908
32.5	.008538	34,717	.003076	27,596
33.5	.005336	34,717	.002393	27,596
34.5	.006403	34,717	.001367	27,596
35.5	.004269	35,810	.001367	28,464
36.5	.004269	35,810	.001025	28,464
37.5	.003202	35,810	.000683	28,464
38.5	.002135	35,810	.000342	28,464
39.5	.002135	35,810	.000342	28,464
40.5	.001067	36,080	--	--
41.5	.001067	36,080	--	--
	Average Entry Age		Average Starting Salary	
Officers		22.4		\$16,843
Other Ranks		22.1		\$14,842

APPENDIX 2G

Promotional Salary Scales

<u>Service</u>	<u>Officers</u>	<u>Other Ranks</u>
0	.194	.362
1	.228	.419
2	.270	.480
3	.323	.543
4	.384	.599
5	.447	.639
6	.500	.665
7	.542	.681
8	.576	.694
9	.607	.704
10	.636	.714
11	.663	.723
12	.689	.732
13	.714	.743
14	.735	.754
15	.753	.765
16	.769	.777
17	.785	.790
18	.800	.803
19	.815	.816
20	.829	.829
21	.843	.843
22	.857	.856
23	.870	.870
24	.883	.883
25	.896	.897
26	.908	.910
27	.919	.922
28	.930	.934
29	.941	.947
30	.951	.959
31	.959	.970
32	.967	.979
33	.975	.988
34	.983	.996
35	.991	1.000
36	.995	1.000
37	.998	1.000
38+	1.000	1.000

APPENDIX 3

Summary of the Supplementary Death Benefit Plan

The terms of the plan are set out in Part II of the Canadian Forces Superannuation Act, entitled "Supplementary Death Benefits".

Participants

Members and former members of the Canadian Forces who are eligible for benefits under Part II of the Act are termed "participants". They are divided into non-elective and elective participants.

1. Non-Elective Participants

For purposes of this report "non-elective participants" comprise

- a) members of the regular force on December 31, 1987; and
- b) members of the reserve force* on December 31, 1987 who are, with the approval of the Chief of the Defence Staff, on full-time service in positions in regular force establishments or as supernumeraries to regular force establishments.

2. Elective Participants

For the purpose of this report, "elective participants" include all participants who have ceased to be members in the regular force and have elected to continue as participants under Part II of the Act. The right of election is limited to participants who, at the time they cease to be members, have at least five continuous years of service in the regular force or have been participants under the plan for at least five continuous years. Election must be made either within one year before ceasing to be a member of the regular force or within thirty days afterwards. In the case of a participant not entitled to an immediate annuity on cessation of employment, the death benefit coverage is extended for thirty days after the date of cessation whether or not the participant exercises his right of election. A participant who becomes entitled to an immediate annuity under Part I of the Act or the Defence Services Pension Continuation Act (DSPCA) upon ceasing to be a member of the regular force is deemed to have elected to continue as a participant, but such person may elect to have the amount of his benefit reduced to \$500.

* This class of participant was added by an amendment to the Act in December 1975.

An elective participant who becomes a participant in the Public Service Supplementary Death Benefit Plan ceases to be a participant in this plan. Any such person who subsequently ceases to be a participant in the Public Service Supplementary Death Benefit Plan, without entitlement to an immediate annuity under the Public Service Superannuation Act, who is entitled to an immediate annuity under Part I of the Act or under the DSPCA, is deemed thereupon to regain the status of elective participant in this plan.

Benefits

The basic benefit with respect to a participant means the salary of the participant if it is a multiple of two hundred and fifty dollars or the nearest multiple of two hundred and fifty dollars above such salary, subject to a reduction of one-tenth of that amount for every year of age in excess of sixty attained by the participant. Notwithstanding the foregoing, in the case of an elective participant who, upon ceasing to be a member of the regular force or upon ceasing to be employed in the Public Service, was entitled under Part I of the Act or under the DSPCA to an immediate annuity or pension, the basic benefit shall not be less than five hundred dollars.

Upon ceasing to be a member of the regular force with entitlement to an immediate annuity or pension under Part I of the Act or under the DSPCA, the participant may elect to have the basic benefit reduced to five hundred dollars. Such an election is irrevocable.

For the purpose of determining the amount of basic benefit, the salary of a participant means the greater of his or her pay expressed in terms of an annual rate and \$3,000, if his or her rank is lower than warrant officer, or \$5,000, if his or her rank is warrant officer or higher. (Prior to August 1, 1966, these amounts of \$3,000 and \$5,000 had been the basic benefits, subject to reduction above age 60, for all participants in the two respective groups based on rank regardless of their rates of pay.) The pay of an elective participant means his or her rate of pay at the time of ceasing to be a member of the regular force.

Contributions by Participants

On August 1, 1966, the same date as the basic benefit was changed, the contribution rate for non-elective participants was reduced from 10 cents to 5 cents per month for each \$250 of benefit.

For elective participants entitled to an immediate annuity, the rate of contribution is the same as that for non-elective participants except that upon attaining age 65, the total contribution is reduced by 10 cents per month. This is in recognition of the fact that \$500 of the benefit is paid-up for the remaining lifetime of the participant by means of a single premium credited to the Account by the Government at that time.

For elective participants not entitled to an immediate annuity under Part I of the Act or the DSPCA, the rate of contribution is dependent upon the age of the participant on the thirtieth day immediately following the date on which he ceases to be a member of the regular force. The following schedule shows the applicable rates for quinquennial ages:

<u>Age Last Birthday</u>	<u>Annual Contribution per \$1,000 Benefit</u>	<u>Monthly Contribution per \$1,000 Benefit</u>
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

Credits by Government

In respect of participants who at the time of death were members of the forces or were entitled to an immediate annuity under Part I of the Act or the DSPCA, the Government credits to the Account one-sixth of the benefit paid on which contributions were being paid by the participants at the time of death.

In respect of elective participants who attain age 65 and are entitled to an immediate annuity under Part I of the Act or the DSPCA, the Government credits to the Account an amount representing the single premium for the \$500 of benefit for life, calculated on the basis of the Canadian Life Tables 1950-1952 and interest at 4% per annum. At the same time, the participants cease to pay contributions on the first \$500 of basic benefit.

The Government also credits to the Account, at the end of each quarter of the fiscal year, an amount representing interest calculated by applying to the balance in the Account at the end of the preceding quarter the same rate of interest that is determined each quarter for the purpose of crediting interest in respect of the Canadian Forces Superannuation Account. More details are given on page 10.