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ACTUARIAL REPORT

as at 31 March 1995

PENSION PLAN

for

FEDERALLY APPOINTED JUDGES

February 6, 1997

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

Dear Sir:

Pursuant to section 6 of the *Public Pensions Reporting Act*, I am pleased to submit my report on the actuarial review, as at 31 March 1995, of the pension plan established under the *Judges Act*.

Yours sincerely,

Bernard Dussault
Chief Actuary

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APPENDICES

I- Introduction and Executive Summary

Pursuant to the *Public Pensions Reporting Act* (PPRA), I have made an actuarial review as at 31 March 1995 of the pension plan established under the *Judges Act*. The previous review was made as at 31 December 1991. The date of the next periodic review contemplated by the PPRA is 31 March 1998 at the latest.

As contemplated by accepted actuarial practice, the main purpose of this actuarial report is to show a reasonable and realistic estimate of:

- the balance sheet of the pension plan as at the valuation date, i.e. its assets, liabilities and surplus(deficit) as at that date;
- the annual amount required to amortize over a period of years any surplus or deficit outstanding as at the valuation date; and
- the projected cost of the plan for each of the next three plan years* following the valuation date.

The main findings of this actuarial review are the following:

1. As at 31 March 1995, the plan had a deficit of $573.0 million.

2. The amortization of the deficit over 15 plan years starting in 1996 would require an annual payment of $72.3 million.

3. The normal cost of the plan for the plan year 1996 is 21.90% of payroll, that is $32.4 million, and is estimated to increase to 23.39% and 24.29% of payroll respectively for the following two years.

As well, it is noted that the plan lacks a Superannuation Account and therefore is not funded in accordance with accepted actuarial practice.

This report is based on the plan provisions described in Appendix 1; they remain unchanged from the previous valuation. As required by the PPRA, the plan is deemed to include the related benefits (inflation adjustments) payable under the Supplementary Retirement Benefits (SRB) Act as well as the related assets of the SRB Account.

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* 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

II- Data

A- Overview

The data in respect of judges, pensioners, and eligible survivors were provided as at 31 March 1994, and are shown in the summaries of data in Appendix 3. These data were projected to the 31 March 1995 valuation date on the basis of the demographic assumptions of the 1991 valuation and the actual economic experience (0.6% indexation increase for pensioners but no salary increase for judges) during the projection period of one year. The value of the notional assets (see section III-A) in the SRB Account was provided as at 31 March 1995.

1. Judges

There were 922 judges active as at 31 March 1994, of whom 88% were male. The average age last birthday of judges was 59.0 years and the average service was 10.4 completed years. The aggregate annual salary was $144.4 million (average was $156,600). Tables 3D and 3E of Appendix 3 show detailed information by sex on the age and service of judges.

2. Pensioners

There were 222 pensioners as at 31 March 1994, of whom 98% were male. The average age last birthday of pensioners was 77.4 years; at date of retirement or disability, it was 71.3 years. The aggregate annual pension payments were $22.2 million (average was $99,900). Table 3F of Appendix 3 shows detailed information on the benefits in course of payment to pensioners.

3. Eligible Survivors

There were 265 surviving spouses as at 31 March 1994, all of whom were female. The average age last birthday of surviving spouses was 76.6 years; at date of death of the member, it was 64.8 years. The aggregate annual spousal allowance payments were $11.8 million (average was $44,500). Table 3G of Appendix 3 shows detailed information on the benefits in course of payment to eligible survivors, including children.

B- Sources of Valuation Data

The Office of the Registrar of the Supreme Court of Canada provided relevant valuation input data on Supreme Court judges and on the corresponding pensioners and survivors. The Office of the Commissioner for Federal Judicial Affairs provided similar data for all other federally appointed judges and for the corresponding pensioners and survivors. In accordance with section 8 of the *Public Pensions Reporting Act*, the Office of the Comptroller General of Canada provided a certification of the notional assets of the plan for purposes of this valuation.

C- Validation of Valuation Data

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

- reconciling the membership data with that published in the previous valuation report (see tables 3A, 3B, and 3C of Appendix 3);
- checking that the salary of a judge was within a certain range and reasonable in comparison with the salary of that judge in the previous valuation report;
- verifying that the length of service of a judge was reasonable in relation to attained age; and
- comparing the initial pension of each judge retiring during the intervaluation period with the expected pension based on the 31 December 1991 valuation data.

Based on the omissions and discrepancies identified by these and other tests, appropriate adjustments were made to the basic data after consulting with the data providers.

D- Acknowledgements

With respect to the collection of data, the co-operation and able assistance received from the offices of the Registrar of the Supreme Court of Canada, the Commissioner for Federal Judicial Affairs, and the Comptroller General deserve to be acknowledged.

III- Methods

A- Notional Assets

The plan's assets are deemed equal to the balance in the SRB Account which:

- consists of notional assets, meaning that no debt instrument has been issued to the Account by the government in recognition of the amounts therein;
- is the only account set up for the plan; and
- is maintained only in respect of a portion of the indexation provision.

These assets are shown at book value, as opposed to market value, because the balance in the SRB Account is exclusively constituted of notional government securities.

As most of the past contributions made to the plan have been credited to the Consolidated Revenue Fund (CRF) but not identified through a specific account, they could also represent additional notional assets of the plan. However, the value of all these past contributions is lower than the value of all past benefits charged to the CRF in respect of the plan. Therefore, the plan's assets are deemed to be equal to the balance in the SRB Account.

B- Normal Costs

Although the plan provides benefits that do not vary by length of service, the projected accrued benefit (also known as the projected unit credit) actuarial cost method was used to compute normal costs. Under this method, the normal cost computed in respect of a given year corresponds to the value, discounted in accordance with the assumed interest rates described in section D below, of all future benefits considered to accrue in respect of that year's service. Consistent with this cost method, salaries are projected up to retirement using the assumed annual increases in average salaries.

To allow use of the projected accrued benefit actuarial cost method, it was necessary to express each judge's projected benefit in unit credit terms, for each type of benefit. To do so, the benefit projected in respect of a given judge was considered to have accrued uniformly from the date of the judge's appointment to the commencement date of that benefit.

C- Liabilities

1. Judges

Consistent with the projected unit credit actuarial cost method employed to estimate normal costs, the plan's liabilities in respect of active judges as at the valuation date correspond to the value, discounted in accordance with the assumed interest rates, described in section D below, of all future benefits considered to have accrued as at that date in respect of all prior years' service.

2. Pensioners and Survivors

Consistent with accepted actuarial practice and standards, the plan's liabilities as at the valuation date in respect of pensioners and survivors correspond to the value, discounted in accordance with the assumed interest rates, described in section D below, of all future benefits already in pay as at the valuation date.

D- Assumed Interest Rates

The rates of interest (see section IV-E) assumed in computing the present value of benefits involved in the projection of the normal costs and liabilities mentioned in sections B and C above are the projected fund yields that would be used for the statutory actuarial valuation of the plans established under the Public Service, Canadian Forces, and Royal Canadian Mounted Police Superannuation Acts. As there is no financing arrangement for the Judges' plan, these three plans were deemed the most appropriate reference as to what an eventual arrangement could look like. The yields were determined using the open-group approach, meaning that expected future contributions are taken into account in projecting the annual yield on the combined Superannuation Accounts of the three plans.

The open-group approach was adopted in accordance with the plan provision, common to the three above-mentioned plans, stipulating that the average yield on the combined accounts is to be used in allocating aggregate investment earnings to each of the three accounts.

The projected fund yields were determined by an iterative process involving all investment components of the three accounts as at the valuation date, the assumed future new money interest rates (also shown in section IV-E), and all future contributions as well as all future expected benefits payable in respect of pension entitlements accruing both before and after the valuation date.

In previous reports, the projected yields were determined on a closed-group basis. The effect of the new open-group approach is shown in section V-D on the reconciliation of notional surplus(deficit) and normal cost.

V- Assumptions

A- Basic Economic Assumptions

The following basic economic assumptions are required for valuation purposes in respect of each year following the valuation date:

- average new money interest rate applicable to 20-year-and-over Government of Canada bonds purchased during the year;
- increase in the Consumer Price Index (CPI);
- increase in the Industrial Aggregate of average weekly earnings, and
- increase in judges' average annual salary.

These assumptions were determined by analysing past experience (last 10, 25, and 50 years), current experience, and expectations for the future. Three main conclusions were reached as a result of these analyses:

1. High current real rates of return (i.e. the excess of new money interest rates over annual increases in the CPI) on 20-year-and-over Government of Canada bonds are expected to return eventually to 3% per annum.

2. Low current increases in the CPI will rise gradually to reach eventually an ultimate level of 3% per annum.

3. Low current real annual increases in the Industrial Aggregate of average weekly earnings (i.e. the difference between annual increases in average earnings and annual increases in the CPI) will rise gradually to reach eventually an ultimate level of 1% per annum. Judicial salaries, being indexed to the Industrial Aggregate, will follow the same pattern except for a continuation of the current salary freeze until 31 March 1997. As in previous valuations, a promotional salary increase scale was not included because promotion (elevation to a higher court or to such positions as Chief Justice or Associate Chief Justice) occurs so infrequently that it has proven to be immaterial for valuation purposes.

These conclusions are the same as those underlying the ultimate (i.e. after 1998) values assumed for the previous valuation. The rationale is as follows:

1. The assumed ultimate real rate of return on 20-year-and-over Government of Canada bonds at 3% per annum appears a reasonable floor level relative to the average experience of the last 25 years and the expected impact on the Canadian economy of free trade, international competition, size of the public debt, and other factors.

2. The assumed ultimate level of inflation at 3% per annum, with the prospects of stable moderate inflation from now on, appears appropriate. Inflation was fairly stable at levels of 4% to 5% in the 1983-1991 period, but dropped below 2% in the period 1992 to 1995. Considering the normal fluctuations in the financial and labour markets, it is not expected that inflation will remain at these relatively low levels forever. The CPI increased annually by 6.03% and 4.63% on average over the past 25 and 50 years, respectively.

3. The assumed ultimate productivity rate was kept at 1% per annum, which lies between the average Canadian experience over the past 25 years (0.59% per annum) and 50 years (1.50% per annum).

B- Derived Economic Assumptions

The following assumptions were derived from the basic economic assumptions:

1. Yearly Fund Yields

Such yields are required for the computation of present values of benefits involved in the determination of the plan's liabilities and normal costs. The methodology used to determine the projected fund yields is described in section III-D.

2. Year's Increase in the Pension Indexing Factor

The year's pension indexing factor is involved in the valuation process by virtue of its role in the pension inflation adjustments. It was derived by applying the Benefit Index formula, described in Appendix 1, which relates to assumed CPI increases over successive 12-month periods ending on 30 September.

C- Margins Against Adverse Fluctuations

Actuarial valuations prepared for private employers' pension plans normally include safety margins. This is done mainly to ensure that on plan wind-up there would be, taking into account possible future fluctuations in economic and demographic factors, sufficient funds for the payment of all future benefits accrued as at the wind-up date. Such rationale does not appear to apply to the judges' plan because the plan sponsor is the Government of Canada.

However, a secondary objective of a margin consists of ensuring as much as possible that any eventual difference between notional assets and liabilities will be positive rather than negative, and therefore that any required financing adjustments will be in respect of a surplus rather than a deficit. This objective is deemed to be met implicitly through the assumed ultimate real rate of return on investments which, at 3% per annum, most likely errs on the safe side.

In previous reports, the explicit margin corresponded to a reduction of 1% in the yearly projected fund yield provided it would not fall below 6%. For this report, the explicit margin was removed.

As may be seen in section V-D, the removal of the explicit margin entails a material reduction in the liabilities and in the normal cost.

D- Administration Expenses

No provision was made regarding the expenses incurred for the administration of the plan in computing its liabilities and normal costs because it is administered by the government with no related charge applied to the plan assets.

E- Summary of Basic and Derived Economic Assumptions

	Interest		Inflation		Employment Earnings	
Plan Year	New Money Intere	Valuation Rate	CPI Increa	Pension Indexing	Industrial Aggregate Increase (%)	Judges' Salary Increase (%)
1996	8.8	10.3	1.6	1.6*	2.6	0.0*
1997	8.0	10.2	2.0	1.8	2.8	0.0
1998	7.0	9.9	2.0	2.0	3.1	3.1
1999	6.7	9.6	2.8	2.4	3.6	3.6
2000	6.4	9.4	3.0	2.9	4.0	4.0
2001	6.2	9.1	3.0	3.0	4.0	4.0
2002	6.0	8.7	3.0	3.0	4.0	4.0
2003	6.0	8.4	3.0	3.0	4.0	4.0
2004	6.0	8.1	3.0	3.0	4.0	4.0
2005	6.0	7.8	3.0	3.0	4.0	4.0
2006	6.0	7.6	3.0	3.0	4.0	4.0
2007	6.0	7.4	3.0	3.0	4.0	4.0
2008	6.0	7.3	3.0	3.0	4.0	4.0
2009	6.0	7.2	3.0	3.0	4.0	4.0
2010	6.0	7.0	3.0	3.0	4.0	4.0
2011	6.0	6.8	3.0	3.0	4.0	4.0
2012	6.0	6.6	3.0	3.0	4.0	4.0
2013	6.0	6.5	3.0	3.0	4.0	4.0
2014	6.0	6.4	3.0	3.0	4.0	4.0
2015	6.0	6.3	3.0	3.0	4.0	4.0
2016	6.0	6.2	3.0	3.0	4.0	4.0
2017	6.0	6.1	3.0	3.0	4.0	4.0
2018	6.0	6.1	3.0	3.0	4.0	4.0
2019+	6.0	6.0	3.0	3.0	4.0	4.0

* These figures reflect actual experience.

F- Demographic Assumptions

Except where otherwise noted, the demographic assumptions were obtained by revising the demographic assumptions of the previous valuation to reflect the experience of January 1992 to March 1994 to the extent that it was deemed credible.

1. **New Entrants**

   To estimate the normal costs shown in the cost certificate (section V-B), assumptions were made as to the number, sex, age, and initial salary of future new judges. It was assumed that the number and sex of the new judges would be such that the population of male judges remains level whereas that of female judges rises by 7% annually. For each sex, the age distribution of the future new judges was based on that of the actual new judges in the January 1992 to March 1994 period. The initial salary of new judges was assumed to be $155,800 for the 1996 plan year, with increases in future plan years in accordance with the assumption for judges' salary increases.

2. **Judges**

   Table 2A of Appendix 2 shows the assumed rates of decrement arising from pensionable disabilities (judge becomes a *disability pensioner* entitled to an immediate disability pension) and pensionable retirements (judge becomes a *retirement pensioner* entitled to an immediate retirement pension). The assumed rates of pensionable disability are 5% lower than in the previous valuation whereas the assumed rates of pensionable retirement are approximately 15% higher than the rates of the previous valuation.

   Table 2B of Appendix 2 shows the assumed rates of mortality for the 1996 plan year. The rates of mortality deemed applicable to male judges in the 1996 plan year are slightly lower on average than the rates assumed for that year in the previous valuation; the opposite is true for female judges. Mortality rates for years subsequent to the 1996 plan year are obtained by applying the longevity improvement factors shown in table 2C of Appendix 2.

   It was assumed that no judge would step down with only a return of contributions; the previous valuation assumed very low rates of nonvested termination up to age 60.

3. **Pensioners**

   The mortality basis deemed to apply to Judges (see section 2 above) is also assumed to apply to retirement pensioners.

   The footnote to table 2B of Appendix 2 shows that a disability pensioner is assumed to experience the same mortality as a retirement pensioner ten years older; this age differential has been carried over from the 1991 valuation.

4. **Surviving Spouses**

   Tables 2D and 2E of Appendix 2 show the proportion of judges and pensioners assumed to leave, upon death, a spouse eligible for a survivor pension under the plan. Up to age

90, the assumed probability of a male leaving a widow is marginally higher than in the previous valuation. The assumed probability of a female at the pensioner ages leaving an eligible widower is approximately one third less than under the previous assumption.

Tables 2D and 2E of Appendix 2 also show the assumed age difference between the surviving spouse and the deceased judge or pensioner. There is little change from the previous valuation, except that the widow of a male at least 90 years old is now expected to be anywhere from two to six years older than was previously assumed.

As in the last valuation, it was assumed that surviving spouses are subject to the same mortality as judges and retirement pensioners of the same age and sex.

5. Surviving Children

It was assumed that the number of eligible children surviving a judge or pensioner would be in accordance with tables 2D and 2E of Appendix 2, which also show the assumed average age of those survivors. To determine the value of pensions payable to children, the rates of pension termination were assumed to be zero if age 17 had not yet been attained, and 12% per annum thereafter until expiry of the benefit on the 25th birthday. All of these assumptions are materially the same as in the previous valuation.

G- Other Assumptions

1. Normal Retirement Age

Judges appointed to a county court, the Federal Court of Canada or the Tax Court of Canada prior to 1 March 1987 may elect to retire normally as early as age 70 instead of age 75. Inasmuch as no such elections were made during the intervaluation period, this provision of the plan was ignored for valuation purposes.

2. Reversals and Recoveries

It was assumed that no pensioners, current or future, would return to the bench.

3. Minimum Death Benefit

This valuation does not take into account the minimum death benefit, described in Note 10 of Appendix 1, in respect of deaths occurring after retirement. The resulting understatement of accrued liability and normal cost is immaterial because relatively few pensioners in the early years of retirement die without leaving an eligible survivor.

V- Valuation Results

A- Balance Sheet as at 31 March 1995

The following balance sheet was prepared using the data described in section II, the valuation methods described in section III, and the assumptions described in section IV.

Notional Assets		$ millions
Balance in SRB Account		37.8
Liabilities		
For prospective pensions and annuities not yet in pay		349.3
For pensions and annuities already in pay		
C Retirement pensioners	132.5	
C Disability pensioners	29.7	
C Surviving spouses	98.9	
C Surviving children	0.4	
		261.5
Total Liabilities		610.8
Surplus(Deficit)		(573.0))

B- Cost Certificate

The normal costs, the notional assets and the liabilities of the plan were computed using the data described in section II, the valuation methods described in section III, and the assumptions described in section IV. Emerging experience, differing from the corresponding assumptions, will result in gains or losses which will be revealed in subsequent reports.

1. Normal Costs

The following normal costs are expressed as a percentage of payroll.

Plan Year	Judges' Portion (%)	Government's Portion (%)	Normal Cost (%)
1996	6.37	15.53	21.90
1997	6.45	16.94	23.39
1998	6.51	17.78	24.29

The above table shows increases in the normal cost for the 1997 and 1998 plan years. This gradual increase in the normal cost reflects mainly the partial transition from the current to the ultimate economic assumptions. The judges' portion of the normal cost rises each year as judges contributing 1.5% of salary (namely, those appointed prior to 17 February 1975) are assumed to be replaced by new judges contributing 7% of salary.

2. Balance Sheet

The total liabilities of the plan are estimated at $610.8 million as at 31 March 1995. The notional assets of $37.8 million as at the same date therefore fall short of the liabilities, corresponding to a deficit of $573.0 million. Amortizing this unfunded liability over 15 years would require an annual payment of $72.3 million, estimated using the yields described in section III-D.

C- Sensitivity of Normal Costs to Variations in Key Assumptions

The supplementary results shown below provide an indication of the degree to which the results shown in the Cost Certificate depend on some of its key assumptions. The differences between the results below and those shown in the Cost Certificate can also serve as a basis for approximating the effect of variations in the key assumptions. However, it must be borne in mind that any such calculation does not take into account either the extent to which the effect of changing a given assumption may not be strictly linear or the interaction effect that may come into play when more than one assumption is changed.

1. Ultimate, as Opposed to Streamed, Economic Assumptions

The 1996 normal cost of 21.90% of payroll takes into account, among other things, that the projected fund yields until 2018 are higher than the ultimate level of 6% assumed thereafter. If the projected fund yields and other economic factors were deemed constant at their otherwise assumed ultimate values (i.e. 6% interest, 4% increase in average salaries, and 3% inflation) from the valuation date onward, the resulting normal cost for 1996 would be 31.66% instead of 21.90% of payroll.

2. Productivity (real rate of increase in average salaries)

If the productivity gains assumed for the 1996 normal cost were reduced by 0.5% from 1998 onward, then the 1996 normal cost would decrease by 0.89% of payroll (from 21.90% to 21.01%).

3. Interest Rate

The 1996 normal cost of 21.90% is based on a deemed investment policy of buying and holding 20-year-and-over Government of Canada bonds. If the deemed investments also included a significant equity component, it would be appropriate to assume higher real rates of return. As a measure of sensitivity, an increment of one percentage point in the projected fund yields would decrease the 1996 normal cost by 3.49% of payroll (from 21.90% to 18.41%).

4. Pension Indexing

If the pension indexation assumption were reduced by 1% (i.e. from 3% to 2% ultimately) in all years, then the 1996 normal cost would decrease by 1.83% of payroll (from 21.90% to 20.07%).

5. Mortality

If the mortality rates assumed in each future year were reduced by 10%, then the 1996 normal cost would increase by 0.59% of payroll (from 21.90% to 22.49%).

If the assumed improvements in longevity after the 1996 plan year (see Table 2C of Appendix 2) were disregarded, then the 1996 normal cost would decrease by 1.29% of payroll (from 21.90% to 20.61%).

D- Reconciliation of Results with the Previous Report

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

	Surplus(Deficit) ($ millions)		Normal Cost (% of payroll)	
At 31 December 1991		(493.7)		23.46
Interest on initial surplus(deficit)		(173.9)		-
Expected normal cost change		-		3.48
Data corrections		(0.5)		-
Cost/contributions difference		(121.6)		-
Benefit payments charged to CRF		121.3		-
Experience gains(losses)				
Pension indexation	7.3			
Pensionable retirements	(6.2)		-	
Pensionable disabilities	4.7		-	
Mortality	(3.2)		-	
New entrants	-		(0.43)	
Minor items	(1.5)		-	
Residual items	4.7		(0.04)	
Subtotal		5.8		(0.47)
Removal of margin		65.6		(3.06)
Revision of valuation assumptions				
Salary increases	24.7		(0.91)	
Interest rates	22.6		(1.13)	
Mortality	(20.3)		0.60	
Pension indexation	8.9		(0.06)	
Proportion married at death	(4.9)		0.19	
Widow(er) age	4.7		(0.18)	
Pensionable retirements	(4.6)		0.28	
Minor items	0.4		(0.09)	
Subtotal		31.5		(1.30)
Revision of valuation methodology				
Adoption of open-group approach	(12.1)		0.60	
Refinements of valuation procedures	4.6		(0.81)	
Subtotal		(7.5)		(0.21)
At 31 March 1995		(573.0)		21.90

Explanations of the above reconciliation

1. **Interest on Initial Surplus(Deficit)**
   The interest to 31 March 1995 on the deficit of $493.7 million as at 31 December 1991 amounted to $173.9 million, based on the interest rates assumed in the previous report for the 3.25-year intervaluation period.

2. **Expected Normal Cost Change**
   The gradual increase in the normal cost from 1992 to 1995 projected in the previous report mainly reflected a partial transition from the current to the ultimate economic assumptions and, to a minor degree, the expected changes in the demographic characteristics of the active contributors.

3. **Cost/Contributions Difference**
   In accordance with the previous cost certificate, the normal cost for the intervaluation period of 3.25 years was $109.5 million. However, the portion of contributions and credits made to the sole funding vehicle (namely, the balance held in the SRB Account) amounted to only $7.6 million. This cost/contributions difference accumulated with interest caused the deficit to rise by $121.6 million.

4. **Benefit Payments Charged to Consolidated Revenue Fund**
   The Consolidated Revenue Fund bears the cost of all benefits paid to or in respect of a member, except for the relatively small amounts charged to the SRB Account. Because the plan's only funding vehicle (i.e. the SRB Account) was charged with virtually none of the benefits paid during the intervaluation period, the deficit decreased by $121.3 million.

5. **Removal of Margin**
   Removal of the margin from the relevant projected fund yields decreased the deficit by $65.6 million and the normal cost by 3.06% of payroll.

6. **Salary Increases**
   The assumed salary increases for the rest of the decade are lower than in the previous valuation. In fact, salaries are now assumed to be frozen until 1 April 1997. The revision of the salary increase assumption caused the deficit to fall by $24.7 million and the normal cost to fall by 0.91% of payroll.

7. **Interest Rates**
   For the plan years 1997 to 2014 inclusive, the closed-group projected fund yields are materially greater (0.4% per annum on average) than the corresponding closed-group projected fund yields of the previous valuation. As a result, the deficit decreased by $22.6 million and the normal cost decreased by 1.13% of payroll.These closed-group yields are not shown in this report because the open-group approach was adopted for valuation purposes for the first time in this report, as described in section III-D (see also item 10(a) below).

8. Mortality

The revised mortality rates for the 1996 plan year are, in general, slightly lower than the rates assumed for that year in the previous valuation. Consequently the deficit rose by $20.3 million and the normal cost rose by 0.60% of payroll.

9. Pension Indexation

The revised pension indexation assumption for the five years following the valuation date is noticeably lower than was assumed in the previous valuation. As a result the deficit decreased by $8.9 million and the normal cost decreased by 0.06% of payroll.

10. Revision of Valuation Methodology

(a) For the projection of average fund yields, the change from a closed-group to an open-group basis produces lower yields for calculating the present values of benefits. Accordingly the deficit rose by $12.1 million and the normal cost rose by 0.60% of payroll.

(b) In the previous report, the valuation methodology included certain simplifying approximations in respect of new entrants and surviving spouses. Replacement of these approximations by exact calculations decreased the deficit by $4.6 million and decreased the normal cost by 0.81% of payroll.

VI- Conclusions

A- Financing of the Plan

If accepted actuarial practice for funding pension plans were followed, the plan would be financed as the major federal public sector pension plans are financed. A Superannuation Account would be established and credited with:

- normal cost contributions, determined in accordance with the most recent Cost Certificate;
- deficit amortization payments, determined in accordance with the most recent Cost Certificate; and
- the plan's notional assets, which would be transferred from the SRB Account.

The new Account would be charged with all benefit payments made in accordance with the pla provisions.

B- Actuarial Standards

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

- the valuation input data on which it is based are sufficient and reliable;
- the assumptions that have been used are, in aggregate, appropriate;
- the methods employed are appropriate;
- the value of the notional assets would be less than the liabilities if the plan were to be wound up at the valuation date; and
- this report has been prepared, and my opinion given, in accordance with accepted actuarial practice, and particularly with the Canadian Institute of Actuaries' standard of practice for the valuation of pension plans.

Bernard Dussault, B.Sc., F.S.A., F.C.I.A.
Chief Actuary

Ottawa, Canada
February 6, 1997

APPENDIX 1

Summary of Provisions, in Force as at 31 March 1995, of the Pension Plan Established under the *Judges Act* and Modified under the *Supplementary Retirement Benefits Act*

The first federal statute dealing with pensions for judges was enacted in 1868, with many subsequent amendments. The current plan provisions are summarized in this Appendix. However, the Act shall prevail if there is a discrepancy between the summary and the Act.

A- Membership

Membership in the plan is compulsory for all judges whom the Government of Canada has appointed to federal or provincial courts.

B- Financing

The plan is largely financed through the CRF. Prescribed contributions are credited to the CRF when they are levied from salaries, and virtually all benefits arising from the plan are charged to the CRF when they become due. However, a relatively small account is maintained within the SRB Account in respect of the benefit indexation provision. This account consists of notional investments of the excess, accumulated in accordance with the prescribed interest rate, of the prescribed indexation-related contributions by members and government over the benefits charged to this Account.

1. Contributions

(a) Judges

C Judges appointed before 17 February 1975 contribute to:
  < the CRF at 1.5% of salary.

C All other judges contribute to:
  < the CRF at 6% of salary, and
  < the SRB Account at 1% of salary.

(b) Government

C The government contributes to:
  < the CRF to the extent that plan benefits paid therefrom exceed contributions by judges thereto, and
  < the SRB Account at 1% of salary.

2. Interest

Interest is credited quarterly on the minimum monthly balances in the SRB Account at the monthly rate corresponding to the effective annual yield, reduced by 0.125%, available at the end of the month on 5-year Government of Canada bonds.

3. Benefits

Virtually all benefits under the plan are charged to the CRF when they become due. Only some minor benefits are charged to the SRB Account, notably the full or partial return of a judge's past SRB contributions (1% of salary) upon his/her death leaving no survivors.

C- Summary Description of Benefits

The explanatory notes referred to in this summary description are given in section D of this Appendix.

1. Judges

Type of Termination	Benefit
Normal pensionable retirement (Note 1)	Immediate annuity (Note 2), reduced pro-rata if under 10 years of service (Note 3)
Early pensionable retirement (Note 1)*	Immediate annuity
Pensionable disability	Immediate annuity
Nonvested termination (Note 4)	Return of contributions (Note 5)
Death leaving no eligible survivor (Notes 6 and 7)	Return of contributions. Also, lump sum to an ineligible surviving spouse (Note 8)
Death leaving eligible survivor(s)	Annuity to eligible survivor(s) (Note 9). Also, lump sum to a surviving spouse (Note 8)

2. Pensioners

Type of Termination	Benefit
Death leaving no eligible survivor	Residual benefit (Note 10), if applicable, to estate
Death leaving eligible survivor(s)	Annuity to eligible survivor(s)

* Includes pensionable retirement before age 65 in the national interest or conducive to better administration of justice.

3. Indexation

Pensions payable from the plan are increased every January to the extent warranted by the increased cost of living, as measured by the Benefit Index.

The Benefit Index in respect of a calendar year is the Benefit Index for the preceding year multiplied by the ratio of the average of the Consumer Price Index for the twelve-month period ending 30 September of that preceding year to the average for the corresponding period one year earlier.

The benefit adjustment is equal to the initial amount of pension to which the person is entitled, multiplied by the excess, over one, of the ratio of the Benefit Index for the year of payment to the linearly interpolated Benefit Index for the end of the month in which the judge to whom or in respect of whose service the pension is payable ceased to be employed. However, the Benefit Index is not interpolated if employment ceased before 22 June 1982.

D- Explanatory Notes

Note 1: Normal Retirement Age and Pensionable Retirement

The *normal retirement age* is age 75. However, in respect of any judge appointed to a county court, the Federal Court of Canada or the Tax Court of Canada prior to 1 March 1987, the normal retirement age may, at the option of the judge, be as low as age 70.

Normal pensionable retirement means ceasing to hold judicial office on reaching normal retirement age. If at least 10 years of service have then been completed, a full pension is payable; otherwise, a prorated portion of the full pension is payable.

Early pensionable retirement means ceasing to hold judicial office and becoming entitled to a full pension between age 65 and normal retirement age, provided at least 15 years of service have then been completed.

Note 2: Immediate Annuity

Immediate annuity means an annuity that becomes payable immediately upon a pensionable retirement or disability. The annual amount of the annuity is equal to two thirds of the judge's annual salary at the time of ceasing to hold office, or of the then current salary applicable to a higher judicial office, if such higher office was formerly held.

For purposes of this summary, *immediate annuity* also includes the *return of contributions* (Note 5) payable when a pensioner who was appointed as a judge prior to 17 February 1975 first confirms that no survivor annuity would arise in the event of death.

Annuities are payable in equal monthly instalments in arrears until the end of the month in which the pensioner dies. If applicable, either a survivor annuity (Note 9) or a residual benefit (Note 10) is payable upon the death of the pensioner.

Note 3: Service

Service means holding the office of judge of a superior or county court or of the Tax Court of Canada, and includes the office of a person who is a deputy judge by virtue of section 60 of the *Federal Court Act*. Superior court is interpreted to include the Supreme Court of Canada; county court includes any district court.

Note 4: Nonvested Termination

Nonvested termination means ceasing to hold judicial office under any circumstance other than pensionable retirement, pensionable disability, or death.

Note 5: Return of Contributions

Return of contributions means the payment of an amount equal to the accumulated contributions paid into the plan by a judge. Interest is credited at the rate of 4% per annum each 31 December on the accumulated contributions with interest as at the preceding 31 December.

Note 6: Eligible Surviving Spouse

The spouse of a judge is eligible for a survivor annuity when the judge dies, unless the spouse is already in receipt of an annuity under the plan. The spouse of a pensioner is likewise eligible if the marriage was in effect when judicial office was last held.

Note 7: Eligible Surviving Children

Eligible surviving children of a judge or pensioner include each child under age 18 and any child over age 18 and under 25 who is in full-time attendance at a school or university, having been in attendance substantially without interruption since reaching age 18 or, if more recent, since the date of death of the judge or pensioner.

Note 8: Lump Sum for Surviving Spouse

If a judge dies, a lump sum equal to one-sixth of the yearly salary of the judge is paid to the surviving spouse.

Note 9: Annuities to Eligible Survivors

Annuities to the eligible surviving spouse and children of a judge or pensioner become payable immediately upon the death of that individual. The annuity to the eligible surviving spouse is equal to one-third of the annual salary of the judge or to one-half of the pensioner's annuity, as applicable at the time of death. An eligible child receives an annuity equal to 20% of the surviving spouse's annuity, subject to reduction if there are more than four eligible children in the same family. The annuity otherwise payable to an eligible child is doubled if that child is an orphan.

Annuities are payable in equal monthly instalments in arrears until the end of the month in which the survivor dies or otherwise loses eligibility. If applicable, a residual benefit (Note 10) is payable to the estate upon the death of the last survivor.

Note 10: Residual Benefit

Residual benefit is equal to the amount, if any, by which the return of contributions exceeds the aggregate of all amounts paid to and in respect of a pensioner until the death of the pensioner or, if applicable, until the subsequent death or loss of eligibility of the last survivor entitled to an annuity.

APPENDIX 2

Sample Demographic Assumptions

Table 2A

Assumed Rates
of Pensionable Disability and Pensionable Retirement

Age Last Birthday	Pensionable Disability*	Pensionable Retirement**
35	.0004	-
40	.0007	-
45	.0012	-
50	.0021	-
55	.0038	-
60	.0068	-
61	.0077	-
62	.0086	-
63	.0097	-
64	.0109	.0138
65	.0124	.0283
66	.0139	.0307
67	.0156	.0339
68	.0176	.0376
69	.0198	.0422
70	.0222	.0472
71	.0250	.0545
72	.0281	.0626
73	.0316	.0737
74	.0357	.0869
75th birthday	-	1.0000

* Rates apply at ages 65 to 69 only if the judge has less than 15 years of service, and at ages 70 to 74 only if the judge has less than 10 years of service.

** Rates apply only if the judge has at least 15 years of service.

Table 2B

Assumed Rates of Mortality for 1996 Plan Year

Age Last Birthday*	Male	Female
35	.0009	.0005
40	.0011	.0007
45	.0016	.0010
50	.0026	.0014
55	.0044	.0023
60	.0080	.0043
65	.0145	.0085
70	.0237	.0135
75	.0371	.0224
80	.0619	.0388
85	.0974	.0670
90	.1537	.1155
95	.2359	.1856
100	.3206	.2764
105	.4141	.3861
110	.4674	.4580
115	.4700	.4650

* For disability pensioners, actual ages are increased by ten years before entering this table. If the increased age exceeds 115 years, then age 115 is used instead. (There is no corresponding age increase before entering Tables 2C, 2D, and 2E.)

Table 2C

Assumed Improvements in Longevity

Age Last Birthday	Annual % Reduction in Assumed Mortality Rates after 1996 Plan Year	
	Male	Female
35	.75	1.25
40	1.00	1.75
45	1.50	1.75
50	1.50	1.50
55	1.30	1.50
60	1.30	1.50
65	1.30	1.50
70	1.25	1.50
75	1.25	1.45
80	1.20	1.45
85	.90	1.05
90	.55	.70
95	.10	.30

Table 2D

**Assumptions for Survivor Benefits
in Respect of Male Judges or Pensioners**

Age Last Birthday at Death	Proportion Married at Death	Spousal Age Difference*	Eligible Children	
			Number	Average Age
35	.81	(2)	2.94	8
40	.89	(2)	3.07	12
45	.92	(2)	2.71	16
50	.94	(3)	2.02	18
55	.97	(3)	.81	20
60	.96	(4)	.48	20
65	.94	(4)	.13	21
70	.90	(4)	.03	21
75	.85	(5)	.01	22
80	.78	(5)	-	-
85	.67	(5)	-	-
90	.53	(5)	-	-
95	.35	(6)	-	-
100	.17	(6)	-	-
105	.06	(8)	-	-
110	.02	(13)	-	-

* Age of widow less age of judge or pensioner, both calculated at death of judge or pensioner.

Table 2E

Assumptions for Survivor Benefits in Respect of Female Judges or Pensioners

Age Last Birthday at Death	Proportion Married at Death	Spousal Age Difference*	Eligible Children	
			Number	Average Age
35	.85	3	1.54	9
40	.89	3	1.55	14
45	.89	3	1.24	18
50	.89	3	.74	20
55	.89	3	.29	21
60	.82	3	.07	22
65	.73	2	.01	23
70	.60	2	-	-
75	.45	1	-	-
80	.34	1	-	-
85	.22	0	-	-
90	.12	(2)	-	-
95	.05	(3)	-	-
100	.02	(6)	-	-

* Age of widower less age of judge or pensioner, both calculated at death of judge or pensioner.

APPENDIX 3

Summaries of Data

Table 3A

Reconciliation of Membership

The following table, derived from the basic data, shows pertinent statistics concerning judges, pensioners, and survivors during the period from January 1992 to March 1994 inclusive. Tables 3B and 3C show further details on reconciliations, by sex and type, of the judges and pensioners.

	Judges	Retirement Pensioners	Disability Pensioners	Surviving Spouses	Surviving Children
At 31 December 1991	902	157	33	250	11
Data correction	-	-	-	1	-
New entrants	100	-	-	-	-
Pensionable retirements	(56)	56	-	-	-
Pensionable disabilities	(6)	-	6	-	-
Nonvested terminations	-	-	-	-	-
Deaths	(18)	(27)	(3)	(24)	-
New survivors	-	-	-	38	7
Loss of eligibility	-	-	-	-	(6)
At 31 March 1994	922	186	36	265	12

Table 3B

Reconciliation of Judges by Sex

	Males	Females	Total
At 31 December 1991	803	99	902
New entrants	80	20	100
Pensionable retirements	(53)	(3)	(56)
Pensionable disabilities	(5)	(1)	(6)
Nonvested terminations	-	-	-
Deaths	(18)	-	(18)
At 31 March 1994	807	115	922

Table 3C

Reconciliation of Pensioners by Sex

A- Retirement Pensioners

	Males	Females	Total
At 31 December 1991	156	1	157
New pensioners	53	3	56
Deaths	(27)	0	(27)
At 31 March 1994	182	4	186

B- Disability Pensioners

	Males	Females	Total
At 31 December 1991	33	0	33
New pensioners	5	1	6
Deaths	(3)	0	(3)
At 31 March 1994	35	1	36

Table 3D

Number of Male Judges as at 31 March 1994

Age Last Birthday	Completed Years of Service 0-4	5-9	10-14	15-19	20-24	25-29	30-34	All Durations
35-39	1	-	-	-	-	-	-	1
40-44	11	2	-	-	-	-	-	13
45-49	49	12	5	-	-	-	-	66
50-54	58	30	20	4	-	-	-	112
55-59	36	33	39	29	4	-	-	141
60-64	36	52	60	50	26	2	-	226
65-69	4	25	31	62	27	9	3	161
70-74	-	9	17	24	23	8	6	87
All Ages	195	163	172	169	80	19	9	807

Average age last birthday: 60.3 years

Average last anniversary of service: 11.0 years

Average salary: $156,700*

Total payroll: $126,439,500*

* Includes two judges whose salary for valuation purposes was deemed to be the salary applicable to the higher judicial office formerly held.

Table 3E

Number of Female Judges as at 31 March 1994

Age Last Birthday	0-4	5-9	10-14	15-19	20-24	25-29	All Durations
	Completed Years of Service						
35-39	2	-	-	-	-	-	2
40-44	33	5	-	-	-	-	38
45-49	13	11	3	-	-	-	27
50-54	6	11	6	1	-	-	24
55-59	1	-	5	1	-	-	7
60-64	-	2	2	3	-	-	7
65-69	-	-	2	2	1	-	5
70-74	-	1	-	1	2	1	5
All Ages	55	30	18	8	3	1	115

Average age last birthday: 49.6 years

Average last anniversary of service: 6.4 years

Average salary: $156,600

Total payroll: $18,005,400

Table 3F

Pensioners* as at 31 March 1994

Age Last Birthday	Retirement Pensioners Number	Retirement Pensioners Annual Pension Average ($)	Retirement Pensioners Annual Pension Total ($)	Disability Pensioners Number	Disability Pensioners Annual Pension Average ($)	Disability Pensioners Annual Pension Total ($)
55-59	-	-	-	3	112,700	338,000
60-64	-	-	-	7	101,700	712,000
65-69	12	102,600	1,231,000	10	106,100	1,061,000
70-74	28	106,900	2,993,000	6	97,300	584,000
75-79	67	104,300	6,985,000	8	84,800	678,000
80-84	41	96,100	3,939,000	2	93,000	186,000
85-89	27	88,800	2,398,000	-	-	-
90-94	10	95,900	959,000	-	-	-
95-99	1	111,000	111,000	-	-	-
All Ages	186	100,088	18,616,000	36	98,872	3,559,000

Average age last birthday (Retirement Pensioners)

At 31 March 1994: 78.9 years
At retirement: 73.2 years

Average age last birthday (Disability Pensioners)

At 31 March 1994: 69.4 years
At disability: 61.7 years

* All pensioners are males, except for 4 retirement pensioners and 1 disability pensioner.

Table 3G

Eligible Survivors as at 31 March 1994

Age Last Birthday	Number	Yearly Amounts Average ($)	Yearly Amounts Total ($)
45-49	4	52,000	208,000
50-54	1	52,000	52,000
55-59	5	48,000	240,000
60-64	19	50,300	955,000
65-69	45	47,700	2,146,000
70-74	41	47,200	1,935,000
75-79	37	44,700	1,653,000
80-84	46	42,000	1,932,000
85-89	35	42,200	1,476,000
90-94	27	38,500	1,039,000
95-99	4	34,800	139,000
100-104	1	31,000	31,000
Widows*	265	44,555	11,806,000
Children	12	11,182	134,000

Average age last birthday of spouses

At 31 March 1994: 76.6 years
At death of member: 64.8 years

* All surviving spouses are widows.