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

Pension Plan for Federally Appointed Judges

Actuarial Report

(including cost certificate)

as at 31 December 1991

Canada

PENSION PLAN

FOR

FEDERALLY APPOINTED JUDGES

ACTUARIAL REPORT

(including Cost Certificate)

AS AT 31 DECEMBER 1991

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

Ottawa, Canada
K1A 0H2

25 June 1993

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

Sir:

Pursuant to section 6 of the Public Pensions Reporting Act, I have the honour to transmit my valuation report on an actuarial review as at 31 December 1991 of the pension plan established under the Judges Act. The report includes a cost certificate required in accordance with section 5 of the Public Pensions Reporting Act.

Subsection 9(1) of the Public Pensions Reporting Act requires a report, filed with the Minister while Parliament is sitting, to be laid before Parliament within thirty sitting days of its being filed. If Parliament is not then sitting, the Act requires the report to be laid before Parliament on any of the first thirty sitting days thereafter.

Yours sincerely,

Bernard Dussault

Bernard Dussault
Acting Chief Actuary

TABLE OF CONTENTS

APPENDICES

Report on the Actuarial Review as at 31 December 1991
of the Pension Plan established under the Judges Act

I. Introduction

Pursuant to paragraphs 3(1)(e) and 3(3)(a) of the Public Pensions Reporting Act (PPRA), we have made an actuarial review as at 31 December 1991 of the pension plan established under the Judges Act.

The previous review was made as at 31 December 1988. Since that date, there has been only one change to the provisions of the plan. Section 46.1 of the Judges Act, added in 1989, stipulates that a lump sum payment, equal to one-sixth of the yearly salary of a judge who dies, shall be paid to the surviving spouse. In Section X of this report we discuss the financial impact of the plan change.

For purposes of this report, as required by subsection 3(2) of the PPRA, we have deemed the plan to include the related benefits (inflation adjustments) payable under the Supplementary Retirement Benefits Act and the related assets of the Supplementary Retirement Benefits Account.

Section VIII of this report is the cost certificate required by section 5 of the PPRA.

II. Plan Overview

The provisions of the plan established under the Judges Act are described in greater detail in Appendix 1. The plan is in many respects similar to the plans established by the government for public servants, the Canadian Forces, and the Royal Canadian Mounted Police. It provides fully-indexed annuities to members who retire or become disabled, and to all eligible survivors. As well, lump sum payments are made under certain circumstances. Although the members make significant contributions toward the cost of these benefits, the government bears most of the burden itself.

Although the pension plan for judges shares many similarities with the other government-sponsored plans, there are significant differences that set it apart from them. The remainder of this section discusses those differences in depth.

A. Simplicity of Benefit Formula

Unlike the other public sector pension plans, the Judges' plan lacks an explicit accrual rate for benefits. The full benefit amount is payable to all who qualify for a given benefit, regardless of length of service. As it happens, plan membership is the only qualification necessary for each benefit except the normal retirement annuity, which is available only to a judge who is at least age 65 and has at least 15 years of service. If a judge retires before satisfying both criteria, the benefit is normally just a return of accumulated contributions (a much less valuable benefit than the annuity), as opposed to the prorated amounts of pension available under the other plans.

The lack of an explicit benefit accrual rate also complicates the actuarial method employed to determine the actuarial liabilities and the normal cost. As described in Section III, it was necessary to impute a benefit accrual rate so that we could use the projected accrued benefit cost method.

B. Financing of Plan

The actuarial method upon which we base the cost certificate of Section VIII assumes the development of a substantial pension "fund". The government normally holds the "fund" assets of any pension plan it sponsors in a separate account for that plan. No such account exists for this pension plan, other than the relatively small sums deposited into the Supplementary Retirement Benefits (SRB) Account to the credit of judges appointed after 16 February 1975. Therefore, the normal costs recommended by the certificate have not been credited to any account. It follows that the financing of this plan is not in accordance with the cost certificate provided in Section VIII.

Except for the minor SRB Account component, the government finances the plan through the Consolidated Revenue Fund (CRF) on a current basis. It makes periodic CRF credits which, when combined with the CRF contributions made by the judges, are equivalent to the benefits paid out in accordance with the terms of the plan.

For 1992 we estimate the government credits to the combined CRF and SRB Accounts to be 17.1% of payroll and the corresponding contributions by judges* to be 6.0% of payroll. The estimated total financing cost (23.1% of payroll) is slightly less than the estimated total normal cost for 1992 shown in Section VIII.

The balance of this report assumes that the plan financing is in accordance with the cost certificate shown in Section VIII.

C. Pension Reform

In the last decade there have been no significant changes to the provisions of the judges pension plan. However, survivor pensions would be significantly increased by Bill C-50, which received first reading in December 1991 and is still before the House.

The judges plan has not been affected by Bill C-55, which amended the other public sector pension plans in 1992. That bill introduced many changes, three of the more important being as follows:

- division of pension benefits upon divorce;
- retirement compensation arrangement (RCA) for high-salaried member; and
- pensioner can now buy survivor benefit for spouse acquired after retirement.

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* Judges appointed prior to 17 February 1975 contribute 1.5% of salary; all others contribute 7% of salary.

III. Actuarial Method

A. Valuation of Assets

We mention in part B of section II above that the plan assets are relatively minor, comprising only individual balances held in the SRB Account for judges appointed after 16 February 1975. Each balance is the cumulative excess of the contribution and interest credits over the benefit charges, all made in accordance with the rules described in Appendix 1.

For this valuation we have calculated the plan assets as the sum of the individual SRB Account balances of all judges, including an adjustment for outstanding items.

B. Actuarial Liability and Normal Cost

Although the plan provides benefits that do not vary by length of service, we have used the projected accrued benefit (unit credit) actuarial cost method for this report. This method contemplates contributions in any year (normal cost) sufficient to pay the unit of projected benefits considered to accrue in respect of service in that year; the actuarial liability corresponds to the actuarial present value of the sum of all units of projected benefits considered to have accrued to the valuation date.

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, we considered a projected benefit in respect of a given judge to have accrued uniformly from the date of the judge's appointment to the commencement date of that benefit.

The actuarial cost method used in this valuation conforms with the recommendations of the Canadian Institute of Chartered Accountants for accounting for pension obligations in government financial statements, contained in "Public Accounting Statement 5" (November 1988).

For the first time, with this report, all benefits are valued using the projected accrued benefit actuarial cost method. In the previous valuation, we used the one-year term cost method to value the disability pensions for judges and the survivor pensions payable upon the pre-retirement deaths of judges.

IV. Valuation Assumptions

This section describes the assumptions used in the valuation. It is divided into three subsections: economic assumptions, demographic assumptions, and other assumptions. Based on our analysis of recent experience and our expectations for the future, we modified most assumptions used in the previous valuation. The actuarial analysis supporting the major modifications is in Section X.

A. Economic Assumptions

1. Basic Economic Assumptions

For each future calendar year, we needed to make a numerical assumption for each of the following basic economic factors:

- average yield available on purchase of a 20-year federal bond ("new money rates");
- increase in the Consumer Price Index (CPI); and
- increase in the Industrial Aggregate of average weekly earnings.

To develop these interrelated assumptions, we reviewed economic forecasts, including the projections in the 26 April 1993 federal budget. We reached three principal conclusions as a result of our review of long-term economic forecasts:

- real rates on new long-term investments are likely to return to the traditional level of 3% per annum in the near future;
- inflation will gradually increase to a level of 3% per annum; and
- real salary increases (productivity gains), after fluctuating during the recession, will level off at 1% per annum.

Each of these conclusions differs somewhat from the corresponding assumption adopted in the previous valuation for the ultimate period (1999 and later). The differences, together with the rationale therefor, are as follows:

- The ultimate real interest rate is now 3% per annum as compared with 2.5% per annum. The latter seems low relative to the experience of the last 25 years and the current outlook for the Canadian economy (globalization of markets, size of the public debt, etc.). Accordingly, we have adopted 3% per annum for this valuation.

- The ultimate level of inflation is now 3% per annum as compared with 3.5% per annum. Inflation was fairly stable at levels of 4% to 5% in the 1983-91 period, but dropped below 2% in 1992. With the prospects of moderate inflation from now on, it appears appropriate to reduce the long-term expectations by half a percentage point at this time.

- The ultimate productivity gains are now 1% per annum as compared with 1.3% per annum. In recent actuarial reports consideration was given to using 1% for productivity. We believe that it is time to recognize fully this lower level which is in line with the average experience of the last 25 years.

These assumptions differ only slightly from the ultimate assumptions selected by the government as "management's best estimate" for the measurement of pension obligations in the 1991-92 Public Accounts. The main difference relates to the productivity gains, which were assumed at 0.5% per annum for accounting purposes; an illustration of the effect of this difference is found at the end of Section VIII (Cost Certificate).

2. Derived Economic Assumptions

Having adopted the basic economic assumptions, we were able to develop the following derived assumptions:

- projected fund yields;
- valuation interest rates;
- general salary increases applicable on 1 April of each year; and
- pension indexing factors applicable on 1 January of each year.

For purposes of developing the first two derived assumptions, we considered that the three major public sector pension plans (Public Service, Canadian Forces, and Royal Canadian Mounted Police) had, through a buy-and-hold strategy, accumulated an asset portfolio consisting entirely of 20-year federal bonds. We then assumed that no further contributions would be made after 31 December 1991 since the book value of the notional investments exceeded the corresponding plan liabilities projected for that date. Next we projected the yields on the closed fund beyond 1991 by assuming a continuation of the buy-and-hold strategy and the reinvestment of the net cash flow in each year (borrowing if net cash flow is negative) at the assumed new money rates. Finally we obtained our valuation interest rates by reducing the relevant projected fund yields by one percentage point, but not below 6% per annum.

We based the general salary increase assumption on the assumed increases in the Industrial Aggregate earnings, to which judicial salaries are indexed. However we recognized the salary freeze imposed on the judges for 1993 and 1994.

Lastly, we derived the pension indexing factors by applying the Benefit Index formula, given in the footnote on page 28, to the assumed annual increases in the CPI.

For this valuation, we adopted the following economic assumptions:

Year	Basic Assumptions: New Money Interest (%)	Industrial Aggregate Increases (%)	CPI Increases (%)	Derived Assumptions: Projected Fund Yield (%)	Valuation Interest (%)	General Salary Increases (%)	Pension Indexing (%)
1992	9.1*	3.4*	1.5*	10.9*	9.9	5.4*	5.8*
1993	7.7	3.1	2.5	10.8	9.8	0.0	2.1*
1994	6.7	3.5	2.5	10.6	9.6	0.0	2.3
1995	6.0	3.6	2.6	10.3	9.3	3.5	2.5
1996	6.0	3.7	2.7	10.0	9.0	3.6	2.6
1997	6.0	3.8	2.8	9.7	8.7	3.7	2.7
1998	6.0	3.9	2.9	9.5	8.5	3.8	2.8
1999	6.0	4.0	3.0	9.2	8.2	3.9	2.9
2000	6.0	4.0	3.0	9.0	8.0	4.0	3.0
2001	6.0	4.0	3.0	8.7	7.7	4.0	3.0
2002	6.0	4.0	3.0	8.3	7.3	4.0	3.0
2003	6.0	4.0	3.0	8.0	7.0	4.0	3.0
2004	6.0	4.0	3.0	7.8	6.8	4.0	3.0
2005	6.0	4.0	3.0	7.6	6.6	4.0	3.0
2006	6.0	4.0	3.0	7.4	6.4	4.0	3.0
2007	6.0	4.0	3.0	7.2	6.2	4.0	3.0
2008	6.0	4.0	3.0	7.0	6.0	4.0	3.0
Ultimate	6.0	4.0	3.0	6.0**	6.0	4.0	3.0

* This reflects actual experience.

** The projected fund yield gradually declines from 6.9% in 2009 to 6.0% by 2014.

B. Demographic Assumptions

1. New Entrants

To estimate the normal costs shown in the cost certificate (Section VIII), we made assumptions regarding the number, sex, and age of judges to be appointed in the three years following the valuation date. We assumed that the number and sex of the new judges will be such that the population of male judges rises by 1% annually whereas that of females rises by 10% annually. For each sex we based the age distribution of the future new judges on that of the actual new judges in the 1989-91 period.

2. Judges

Appendix 2 shows the assumed rates of nonvested termination, pensionable disability, pensionable retirement, and mortality applicable to a judge. (A nonvested termination is a termination with entitlement to a return of contributions with interest rather than to a pension; a pensionable disability is a disability causing the judge to become a "disability pensioner" entitled to an immediate disability pension; a pensionable retirement is a retirement on account of age or service, or a combination thereof, causing the judge to become a "retirement pensioner" entitled to an immediate retirement pension.)

The rates of nonvested termination are lower than the corresponding rates in the 1988 valuation (0.0015 versus 0.0050 in the previous report); however, they now apply up to age 59 as opposed to only age 54 previously.

On the one hand, the rates of pensionable disability at almost all ages are noticeably higher than in the previous valuation, the largest change being a sevenfold increase at age 60. There are revised rates for all ages up to age 69, and, for the first time, rates for ages 70 to 74. On the other hand, the application of the rates of pensionable disability has been narrowed by the introduction of a maximum service limitation (15 years at ages 65 to 69 and 10 years at ages 70 to 74).

The revised rates of pensionable retirement at ages 65 to 70 are significantly higher than the corresponding rates in the 1988 valuation; the opposite is true at ages 72 to 74. Unlike the previous valuation report, Appendix 2 explicitly states that the rates are applied only to judges with at least 15 years of service.

The rates of mortality applicable to male judges in 1992 are marginally lower than the rates assumed in the previous valuation; the opposite is true for female judges. Beginning with this valuation, the mortality assumption for judges takes into account the expected future reductions in the rates of mortality at the various ages. Mortality rates for years subsequent to 1992 are obtained by applying to the rates for that year (shown in Appendix 2) the annual improvement factors shown in Appendix 4.

We did not include a promotional salary increase scale in this valuation because promotion (elevation to a higher court or to such positions as Chief Justice or Associate Chief Justice) occurs so infrequently that it is not material.

3. Pensioners

With respect to pensioners, the only decrement is death. As in the previous valuation, the mortality assumptions take into account the expected continued future reductions in the rates of mortality at the various ages.

At most ages, the 1992 mortality rates shown in Appendix 3 for male retirement pensioners are close to the 1989 mortality rates in the previous valuation; for female retirement pensioners, the revised rates are all moderately higher than the former rates.

We normally expect a disability pensioner to be subject to higher mortality rates than a retirement pensioner. Except at the very high ages, the 1992 mortality rates shown in Appendix 3 are based on a disability pensioner experiencing the same mortality as a retirement pensioner ten years older. This level of mortality is significantly higher than that assumed in the 1988 valuation where there was only a seven-year differential.

For all pensioners, we obtained the mortality rates for years subsequent to 1992 by applying the annual improvement factors shown in Appendix 4 to the 1992 mortality rates.

4. Eligible Surviving Spouses

To estimate the value of surviving spouse pensions that will become payable as the result of deaths among judges and pensioners, we must make an assumption about what proportion of them will leave an eligible spouse upon death. The "proportion married" shown in Appendix 5 for males is noticeably higher at all ages than was assumed in the previous valuation; the opposite holds for the new female assumption at ages 65 and above. For both sexes, the proportion married is now non-zero beyond age 102.

Another assumption in respect of surviving spouses concerns the average age of the eligible surviving spouse at the date of death of the judge or pensioner. Except for one-year decreases for deaths at ages 85 to 95, the "average age of widow" shown in Appendix 5 is the same as in the previous valuation; similarly the "average age of widower" has been retained except for one-year increases for deaths up to age 45.

We continued to assume that surviving spouses will be subject to the same underlying mortality as retirement pensioners and judges of the same sex.

5. Eligible Surviving Children

We had to make some assumptions to estimate the value of pensions to surviving children (including full-time students aged 18 to 24 years) that will become payable as the result of deaths among judges and pensioners.

The primary assumption concerns the number of eligible children surviving a judge or pensioner. The expected number of such survivors shown in Appendix 6 for a male death is effectively double that assumed in the previous valuation, but remains unchanged for a female death.

There is also an assumption for the average age of the eligible surviving children when a judge or pensioner dies. Several of the average ages shown in Appendix 6 for a male death differ by one year from those used in the previous valuation; however there was only one minor adjustment for a female death.

For eligible surviving children, we continued to assume that the only two decrements are the losses of eligibility caused by leaving school (ages 18 to 24) and attaining age 25. The rates of leaving school shown in Appendix 6 are equivalent, although expressed differently, to the assumption in the previous valuation for the proportion of students remaining eligible for a year.

C. Other Assumptions

1. Compulsory Retirement before Age 75

Judges having at least 15 years of service have the right to elect pensionable retirement between ages 70 and 75. However certain judges appointed prior to 1 March 1987 (see Note 1 on page 29) have the right to elect compulsory retirement at those ages, thereby becoming entitled to full pensions after the completion of only ten years of service.

Inasmuch as no judges elected compulsory retirement before age 75 during the 1989-91 period, we have ignored this provision of the plan for valuation purposes. Consequently the pensionable retirement decrement between ages 70 and 75 is restricted to judges having at least 15 years of service.

2. Nature of Decrements

We assumed that all decrements were permanent and therefore no subsequent re-entry could occur.

3. Administration Expenses

We made no provisions in either the normal cost or the liabilities for the cost of administering the plan.

V. Reconciliation of Membership

The following table, derived from the basic data, shows pertinent statistics concerning judges, pensioners, and survivors during the years 1989 to 1991.

	Judges	Retirement Pensioners	Disability Pensioners	Surviving Spouses	Surviving Children
At 31 December 1988	829	138	26	234	13
Data correction	-	1	1	-	(1)
New entrants	159	-	-	-	-
Pensionable retirements	(53)	53	-	-	-
Pensionable disabilities	(16)	-	16	-	-
Nonvested terminations	(2)	-	-	-	-
Deaths	(15)	(35)	(10)	(33)	-
New survivors	-	-	-	49	8
Loss of eligibility*	-	-	-	-	(9)
At 31 December 1991	902	157	33	250	11

Appendices 7 and 8 show reconciliations of the judges and pensioners by sex.

* Occurs upon leaving school (ages 18 to 24) or attaining age 25.

VI. Summary and Analysis of Membership Data

A. Judges

There were 902 judges active at the end of 1991, of whom 89.0% were males. The average judge was 58.8 years old with 10.0 years of service. The average annual salary was $148,590 with no discernible trend of salary by either age or service. The annualized payroll as at the end of 1991 was $134.0 million.

Appendices 9A and 9B show detailed information on the age and service of male and female judges, respectively.

B. Pensioners and Survivors

There were 451 recipients of periodic payments from the plan at the end of 1991, of whom 56.8% were females. The two types of claimants were pensioners (190 in number) and survivors (261 in number). At the end of 1991, the plan was paying benefits to the recipients at the following annual rates:

Type of Recipient	Basic Benefits	Supplementary Benefits*	Total
Retirement pensioners	$10,833,000	$3,863,000	$14,696,000
Disability pensioners	2,351,000	726,000	3,077,000
Surviving spouses	5,546,000	4,819,000	10,365,000
Surviving children	102,000	16,000	118,000
Grand totals	$18,832,000	$9,424,000	$28,256,000

Appendices 10A and 10B show detailed information on the benefits in course of payment to pensioners and survivors.

* Amounts reflect accrued indexation (per the Supplementary Retirement Benefits Act) to and including 1 January 1992.

VII. Valuation Balance Sheet

The results for the valuation as at 31 December 1991, based on the actuarial cost method, assumptions and data described in Sections III, IV and VI, respectively, are summarized below.

Assets and Unfunded Actuarial Liability		($ millions)
Balance in Supplementary Retirement Benefits Account in respect of judges		22.4
Unfunded actuarial liability		493.7
Total assets and unfunded actuarial liability		516.1

Actuarial Liability		
For prospective benefits to and in respect of judges		287.2
For benefits in course of payment to:		
• Retirement pensioners	111.1	
• Disability pensioners	28.9	
• Surviving spouses	88.5	
• Surviving children and students	0.4	
		228.9
Total actuarial liability		516.1

VIII. Cost Certificate

We estimated the normal cost of the plan by using the actuarial cost method described in Section III, the assumptions described in Section IV, and the data summarized in Appendices 9A and 9B. (The normal cost for a given year is the annual contribution sufficient to pay for the units of projected benefits considered to accrue in respect of service in that year.)

The resulting normal cost (and the allocation thereof to the judges and the government) is shown below as a percentage of payroll for each of the three years following the review date:

Year	Payable by Judges* (%)	Effective Cost to Government (%)	Normal Cost (%)
1992	6.0	17.5	23.5
1993	6.1	17.9	24.0
1994	6.2	19.5	25.7

Using the same methods, assumptions and data, we estimated the unfunded actuarial liability of the plan to be $493.7 million as at 31 December 1991; this could be amortized by making 15 yearly special payments of $61.1 million, commencing on 31 December 1992.

A. Use of the Cost Certificate

As far as the financing of this pension plan is concerned, the normal cost shown in this cost certificate is of theoretical significance only. (The manner in which this plan is actually financed is described in Section II.) However, the cost certificate is useful because it presents expected normal costs for this pension plan in a manner similar to that used in showing costs for other pension plans sponsored by the government.

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* Judges appointed prior to 17 February 1975 contribute 1.5% of salary; all others contribute 7% of salary.

B. Current and Ultimate Costs

The estimates of the normal cost (see previous page) and of the actuarial liability (see Section VII) are based on dynamic economic assumptions which anticipate that the relatively high real rates of interest (the excess of nominal interest rates over rates of increase in the Consumer Price Index) available at the date of valuation will prevail for some time before they return to more traditional levels. (A "dynamic economic assumption" can vary in each future calendar year. For this report, each economic assumption actually becomes static after a certain period of time.)

Since the 1992 normal cost of 23.5% of payroll reflects the current relatively high real rates of interest, it is not an indicator of the expected long-term cost of the plan. In fact, if we had assumed the ultimate economic assumptions (6.0% interest rates, 4.0% salary increases and 3.0% price increases) to apply from the date of the valuation onward, then the 1992 normal cost would have been 33.1% of payroll. The table on page 16 shows increasing normal costs in 1993 and 1994, mainly reflecting a partial transition to the ultimate economic assumptions.

C. Variation of the Interest Assumption

The early recurrence of more traditional real rates of interest would raise both the normal cost and actuarial liability. The margin in the assumed interest rates, described in Section IV under Economic Assumptions, provides some protection against this contingency. If we removed the margin, the 1992 normal cost would decline in relative terms by 13% and the actuarial liability by 10%.

The ultimate normal cost of 33.1% of payroll assumes an ultimate real interest rate of approximately 3.0% which we consider to be consistent with the plan's deemed investment policy of buying and holding 20-year government bonds. If the hypothetical investments included a significant equity component as well as debt, it would be appropriate to use higher real rates of return. As a measure of sensitivity, an increment of one percentage point in the real interest rate decreases the ultimate normal cost in 1992 by 5.5% of payroll (27.6% rather than 33.1%).

D. Variation of the Productivity Assumption

The ultimate normal cost of 33.1% of payroll assumes ultimate productivity gains (i.e. real salary increases) of 1% per annum. If instead we assumed 0.5% per annum ("management's best estimate" for the 1991-92 Public Accounts), then the ultimate normal cost would decrease by 1.5% of payroll (from 33.1% to 31.6%).

IX. Reconciliation of Actuarial Balance and of Normal Cost

The previous valuation report showed an actuarial balance, which is the excess of assets over actuarial liability, of ($327.7) million; this has now decreased by $166.0 million to ($493.7) million.

The previous report also showed a 1989 normal cost of 22.7% of payroll, rising steadily thereafter almost entirely as a result of the gradual transition from dynamic to ultimate economic assumptions. The anticipated normal cost for 1992 (not shown in that report) was 25.7% of payroll; this is significantly higher than the currently estimated 1992 normal cost of 23.5% of payroll (see Section VIII of this report).

In the following table we show the various factors reconciling the actuarial balance and normal cost in this valuation with those of the previous valuation.

	Actuarial Balance ($ millions)		Normal Cost (% of payroll)	
At 31 December 1988		(327.7)		22.7
Interest on starting actuarial balance		(108.1)		-
Expected normal cost change* over three years		-		3.4
Benefit payments made directly from Consolidated Revenue Fund		80.9		-
Normal cost payments (other than to SRB Account) not made		(88.1)		-
Plan amendment to provide lump sum on death of a married judge		(1.2)		0.1
Experience gains and losses				
Mortality	6.6		-	
Pensionable disabilities	(6.1)		-	
Pensionable retirements	(5.1)			
Pension indexing	(3.7)		-	
Salary increases	(2.7)		-	
Proportion of eligible spouses	(2.5)		-	
New entrants	0.0		(0.3)	
Minor items (net)	(0.6)		-	
Subtotal		(14.1)		(0.3)
Revision of valuation assumptions				
Economic assumptions	50.4		(3.9)	
Pensionable retirements	(10.0)		0.7	
Pensionable disabilities	(5.2)		1.1	
Proportion married	(3.3)		0.4	
Mortality (including projection)	(1.7)		(0.1)	
Minor items (net)	(1.1)		0.1	
Subtotal		29.1		(1.7)
Change in actuarial method		(56.5)		(0.9)
Refinements of valuation procedures		(2.5)		0.2
Miscellaneous		(5.5)		-
At 31 December 1991		(493.7)		23.5

* Due to a partial transition to ultimate economic assumptions and, to a minor degree, the expected changes in the demographic characteristics of the judges.

X. Actuarial Analysis

Section IX shows the experience gains and losses of the plan during the three-year period ending 31 December 1991. It also shows the financial effect of the revisions made to the actuarial assumptions and actuarial method. This section examines the more significant items in some detail.

A. Change in Actuarial Method

In the previous valuation we applied the one-year term cost method to the only plan benefits that have no service requirement (disability and survivor pensions for and in respect of judges); all other benefits were valued on the projected accrued benefit cost method (also called the unit credit actuarial cost method).

In this valuation we considered the lack of a service requirement for a benefit to be equivalent to requiring zero years of service. We extended the use of the unit credit actuarial cost method to value all benefits under the plan, including disability and survivor pensions for and in respect of judges.

Achieving consistency of actuarial cost method raised the actuarial liability substantially (by $56.5 million) while the normal cost dropped modestly (by 0.9% of payroll).

B. Revised Economic Assumptions

We reviewed carefully the economic assumptions made in the previous valuation for the post-1991 period and changed them in light of informed forecasts available in early 1993 and of the budget of 26 April 1993.

For the years 1992 to 1997, all the economic assumptions made in the previous valuation were modified to some degree. For 1998 and subsequent years (the "ultimate" period), the real rate of interest of 2.5% per annum was raised to 3.0% per annum. However the real annual salary increases of 1.3% assumed previously were reduced to 1.0% for this valuation.

The nominal annual rates adopted in this report for the ultimate period are: 6% rate of interest on new money, 4% salary increases, and 3% inflation. These nominal rates produce approximately the real rates referred to in the preceding paragraph.

The revision of economic assumptions was by far the most important of the many changes in actuarial assumptions, causing the actuarial liability and normal cost to decrease by $50.4 million and 3.9% of payroll, respectively.

C. Pensionable Retirements

The unisex rates of pensionable retirement in the previous valuation gave the appearance of being exclusively age-based but in fact there was also a requirement of at least 15 years of service.

During the three years since the last valuation, there were more than three times as many pensionable retirements as expected at ages 65 to 71. Altogether the plan suffered a loss of $5.1 million as a result of the pensionable retirement experience.

We revised the unisex rates of pensionable retirement, giving full credibility to the graduated experience of the plan over the 1986-91 period. As in the last valuation, only judges with at least 15 years of service are subject to pensionable retirement. This revised assumption caused the actuarial liability to increase by $10.0 million and the normal cost by 0.7% of payroll.

D. Pensionable Disabilities

In the previous valuation we assumed an incidence rate of pensionable disability varying by age, but not by sex or length of service.

Based on the assumption in the previous valuation, there should have been only 11 pensionable disabilities during the 1989-91 period, as compared to the 16 actually observed. Consequently there was an experience loss of $6.1 million.

Given the perceived inadequacy of the assumption used in the previous report, we developed a new unisex assumption based on the plan experience. The new disability rates are applied to all judges except those who would qualify for either pensionable retirement or supernumerary status at date of disability, based on their age and service. Adopting the new assumption increased the actuarial liability by $5.2 million and the normal cost by 1.1% of payroll.

E. Mortality of Judges, Pensioners, and Survivors

In the previous valuation the mortality assumption for judges was the GAM83* table; it was the same for retirement pensioners and survivors but with full improvement from 1983 onwards. Disability pensioners were treated as if they were retirement pensioners born seven years earlier.

During the three-year period since the last valuation, the actual mortality of male judges was only 51% of expected (15 deaths versus 29.7 expected). On the other hand, the 10 deaths among the male disability pensioners were 185% of the expected 5.4 deaths. With these two exceptions, the plan's mortality experience was very close to expected. Altogether, there was a gain of $6.6 million from the mortality experience.

We deemed it necessary to develop revised rates of mortality for the base year 1992 for both males and females, giving equal credibility to the GAM83 table and to the 1986-91 experience. At the same time we raised the mortality improvement factors at most ages and applied them to judges as well as to pensioners and survivors. Lastly we raised the age differential for disability pensioners to ten years. After making these changes, we found that both the unfunded actuarial liability and the normal cost were almost unchanged.

F. Impact of Plan Amendment

In 1989 there was a minor plan amendment to make a lump sum payment upon the death of a judge. The lump sum is equal to one-sixth of the judge's yearly salary at date of death and is paid only if there is a surviving spouse. As a result of that amendment, the actuarial liability and normal cost both increased very slightly ($1.2 million and 0.1% of payroll, respectively).

* The GAM83 table was developed by the Society of Actuaries from group annuity mortality experience.

XI. Data and Acknowledgements

The Office of the Registrar of the Supreme Court of Canada provided seriatim records comprising basic valuation data on Supreme Court judges and the corresponding pensioners and survivors. The Office of the Commissioner for Federal Judicial Affairs provided similar records for all other federally appointed judges and the corresponding pensioners and survivors. We examined all records for consistency, interrelationships and general reasonableness with regard to individual judges, pensioners and survivors.

The Office of the Comptroller General supplied information on the applicable portion of the balance in the Supplementary Retirement Benefits Account.

We wish to acknowledge the co-operation and able assistance received from these three Offices.

XII. Actuarial Opinion

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

- the data upon which we based our calculations are sufficient and reliable;
- the assumptions that we used are adequate and appropriate; and
- the methods that we 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.

Bernard Dussault

Bernard Dussault, F.S.A., F.C.I.A.
Acting Chief Actuary

Ottawa, Canada
25 June 1993

APPENDIX 1

Summary of provisions of the pension plan established under the Judges Act and the relevant provisions of the Supplementary Retirement Benefits Act

A. Coverage

This plan covers the following individuals:

- all judges whom the Government of Canada has appointed to federal and provincial courts;
- pensioners entitled to annuities payable under the Judges Act; and
- surviving spouses and children entitled to annuities payable under the Judges Act.

B. Contributions and Credits

1. Contributions from Judges

Judges appointed to the bench before 17 February 1975 make required contributions to the Consolidated Revenue Fund (CRF) of 1.5% of salary. All other judges make required contributions to the CRF of 6% of salary and to the Supplementary Retirement Benefits (SRB) Account of 1% of salary.

2. Credits by Government

In each quarter, the government matches the total amount paid into the SRB Account during that quarter by way of contributions in respect of service rendered by judges.

In addition, the government makes periodic credits to the CRF which, when combined with the CRF contributions made by the judges, are equivalent in amount and timing to the benefits paid out in accordance with the terms of the plan (see "Financing of Plan" in Section II for more details).

3. Interest

The SRB Account is essentially a savings account that earns interest on the minimum monthly balance at the rate, reduced by 0.125%, equivalent to the yield available at the end of the month on five-year federal bonds. Interest is credited quarterly to the SRB Account.

C. Summary of Benefits

(Section D of this Appendix gives the explanatory notes to which reference is made here.)

1. Judges

Type of Termination	Benefit
Compulsory pensionable retirement (Note 1)	Immediate annuity (Note 2), reduced pro-rata if under 10 years of service (Note 3)
Elective 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; lump sum to ineligible surviving spouse (Note 8)
Death leaving eligible survivor(s)	Annuity to eligible survivor(s) (Note 9); lump sum to 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)

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

3. Indexing

The government enacted the Supplementary Retirement Benefits Act (SRBA) in 1970 to provide benefit adjustments related to increases in the Consumer Price Index for persons in receipt of pensions payable from the Consolidated Revenue Fund (CRF). The SRBA applies to pensioners and survivors entitled to annuities under the Judges Act.

The supplementary benefit is equal to the amount of the annuity to which the person is entitled under the Judges Act multiplied by the excess, over one, of the ratio of the Benefit Index* for the year of payment over the Benefit Index for the "deemed date" on which the person in respect of whose service the pension is payable ceased to be a judge. If the actual date of cessation is after 21 June 1982 then the deemed date is the first day of the next following calendar month; otherwise, it is the immediately preceding January 1.

In accordance with the SRBA, there is no charge to the SRB Account for the indexed portion of benefits payable to a pensioner or survivor. However, there is a charge to the SRB Account under some circumstances like the death of a judge without survivors, upon which a full or partial return of a judge's SRBA contributions is payable. As a result, the CRF bears the cost of virtually all SRBA benefits payable in respect of this plan even though the SRB Account receives all SRBA contributions and credits.

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* The SRBA currently defines the Benefit Index in respect of each calendar year as the Benefit Index for the preceding year multiplied by the ratio of the average of the Consumer Price Index for the 12-month period ending 30 September of that preceding year to the average for a corresponding period one year earlier. Prior to 1985, there were some deviations from the current Benefit Index formula.

D. Explanatory Notes to Summary of Benefits in Section C of this Appendix

Note 1: Pensionable Retirement

"Compulsory pensionable retirement" means ceasing to hold judicial office on reaching age 75. However, any judge appointed to a county court, the Federal Court of Canada or the Tax Court of Canada prior to 1 March 1987 has the right to elect to retain the compulsory retirement age of 70 to which that judge was subject before that date.

"Elective pensionable retirement" means ceasing to hold judicial office on or after reaching age 65 and after completing at least 15 years of service (Note 3), but before reaching the applicable compulsory retirement age.

Both compulsory and elective pensionable retirement apply only to a judge who is not retiring due to a pensionable disability.

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 a "return of contributions" (Note 5) payable when a pensioner who served 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 8) or a residual benefit (Note 10) is payable upon the death of the pensioner.

Note 3: Service

"Service" denotes holding "judicial office" which means the office of a judge of a superior or county court or of the Tax Court of Canada, and includes the office of a person who by virtue of section 60 of the Federal Court Act is a deputy judge. 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 payment of an amount equal to the total current service contributions paid by a judge plus interest at the rate of 4% per annum to 31 December of the year immediately preceding the year in which the judge ceased to hold judicial office. Interest is credited each 31 December on the accumulated contributions with interest as at the preceding 31 December.

Note 6: Eligible surviving spouse

A spouse who married a sitting judge is eligible for a survivor annuity upon the judge's subsequent death unless the spouse is at that time in receipt of an annuity granted under the Judges Act.

Note 7: Eligible surviving children

Eligible 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. If applicable, a residual benefit (Note 10) is payable to the estate upon the death of the last survivor.

Note 10: Residual benefit

The "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, the subsequent death of the last survivor entitled to an annuity.

APPENDIX 2

Annual Rates of Decrement for Judges

Age Last Birthday	Nonvested Termination	Pensionable Disability*	Pensionable Retirement**	Mortality for 1992 Male	Mortality for 1992 Female
35	.0015	.0004	-	.0007	.0005
40	.0015	.0007	-	.0010	.0007
45	.0015	.0013	-	.0017	.0011
50	.0015	.0022	-	.0031	.0018
55	.0015	.0040	-	.0052	.0028
56	.0015	.0045	-	.0057	.0031
57	.0015	.0051	-	.0062	.0034
58	.0015	.0057	-	.0067	.0037
59	.0008	.0064	-	.0074	.0042
60	-	.0072	-	.0082	.0047
61	-	.0081	-	.0092	.0052
62	-	.0091	-	.0105	.0057
63	-	.0102	-	.0121	.0063
64	-	.0115	.0122	.0138	.0070
65	-	.0130	.0253	.0156	.0077
66	-	.0146	.0272	.0175	.0086
67	-	.0164	.0297	.0193	.0095
68	-	.0185	.0327	.0212	.0107
69	-	.0208	.0364	.0231	.0121
70	-	.0234	.0410	.0254	.0137
71	-	.0263	.0470	.0281	.0157
72	-	.0296	.0544	.0313	.0180
73	-	.0333	.0635	.0351	.0206
74	-	.0376	.0743***	.0394	.0235

* 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.

*** Applies before the 75th birthday, upon which compulsory pensionable retirement occurs.

APPENDIX 3

Annual Rates of Pensioner and Survivor Mortality for 1992*

Age Last Birthday	Survivors and Retirement Pensioners		Disability Pensioners	
	Males	Females	Males	Females
35	.0007	.0005	.0017	.0011
40	.0010	.0007	.0031	.0018
45	.0017	.0011	.0052	.0028
50	.0031	.0018	.0082	.0047
55	.0052	.0028	.0156	.0077
60	.0082	.0047	.0254	.0137
65	.0156	.0077	.0440	.0267
70	.0254	.0137	.0694	.0473
75	.0440	.0267	.1099	.0765
80	.0694	.0473	.1679	.1237
85	.1099	.0765	.2476	.2043
90	.1679	.1237	.3363	.2955
95	.2476	.2028	.4448	.4040
100	.3508	.3092	.5882	.5523
105	.5036	.4754	.7779	.7551
110	1.0000	1.0000	1.0000	1.0000

* Rates shown for survivors and retirement pensioners up to age 75 are identical to those shown for judges in Appendix 2.

APPENDIX 4

Mortality Improvement Factors

Age Last Birthday	Annual Percentage Reductions After 1992	
	Males	Females
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
100	-	-

APPENDIX 5

Proportion of Judges or Pensioners Leaving Eligible Surviving Widow(er) at Death and Average Age of Newly Eligible Surviving Widow(er)

Age Last Birthday at Death	Proportion Married		Average Age	
	Male	Female	Widow	Widower
35	.79	.73	34	38
40	.87	.80	38	43
45	.90	.83	43	48
50	.92	.85	47	53
55	.94	.88	52	58
60	.94	.89	56	63
65	.93	.85	61	67
70	.88	.78	65	72
75	.83	.67	70	76
80	.73	.48	75	80
85	.61	.33	79	84
90	.50	.20	83	88
95	.38	.11	86	91
100	.25	.05	89	94
105	.12	.01	91	96
110	.04	-	92	-

APPENDIX 6

A. Number and Average Age of Newly Eligible Surviving Children

Age Last Birthday at Death	Number of Children On Male Death	Number of Children On Female Death	Average Age of Children On Male Death	Average Age of Children On Female Death
35	2.94	1.54	8	9
40	3.07	1.54	12	14
45	2.71	1.24	16	18
50	2.02	.74	18	20
55	.81	.29	20	21
60	.48	.07	20	22
65	.13	.01	21	23
70	.03	-	21	-
75	.01	-	22	-

B. Annual Rates of Leaving School for Eligible Surviving Children

Age Last Birthday	Rate of Decrement
17	.06
18	.13
19	.10
20	.11
21	.13
22	.15
23	.18
24	.23*

* Applies before the 25th birthday, upon which eligibility expires.

APPENDIX 7

Reconciliation of Judges by Sex

	Males	Females	Total
At 31 December 1988	766	63	829
New entrants	121	38	159
Pensionable retirements	(52)	(1)	(53)
Pensionable disabilities	(16)	0	(16)
Nonvested terminations	(1)	(1)	(2)
Deaths	(15)	0	(15)
At 31 December 1991	803	99	902

APPENDIX 8

Reconciliation of Pensioners by Sex

A. Retirement Pensioners

	Males	Females	Total
At 31 December 1988	138	0	138
Data corrections	1	0	1
New pensioners	52	1	53
Deaths	(35)	0	(35)
At 31 December 1991	156	1	157

B. Disability Pensioners

	Males	Females	Total
At 31 December 1988	26	0	26
Data corrections	1	0	1
New pensioners	16	0	16
Deaths	(10)	0	(10)
At 31 December 1991	33	0	33

APPENDIX 9A

Number of Male Judges as at 31 December 1991

Age Last Birthday	Completed Years of Service 0-4	5-9	10-14	15-19	20-24	25-29	30-34	All Durations
40-44	12	5	-	-	-	-	-	17
45-49	37	16	3	-	-	-	-	56
50-54	52	40	19	3	-	-	-	114
55-59	48	60	45	24	7	-	-	184
60-64	22	54	59	54	15	-	-	204
65-69	7	21	37	50	20	10	-	145
70-74	1	9	16	28	12	15	2	83
All Ages	179	205	179	159	54	25	2	803

Average age last birthday: 59.9 years

Average completed years of service: 10.5 years

Average salary: $148,600

Total payroll: $119,325,800

APPENDIX 9B

Number of Female Judges as at 31 December 1991

Age Last Birthday	Completed Years of Service 0-4	5-9	10-14	15-19	20-24	25-29	All Durations
35-39	5	-	-	-	-	-	5
40-44	31	2	-	-	-	-	33
45-49	8	11	4	-	-	-	23
50-54	6	4	2	1	-	-	13
55-59	1	2	3	1	-	-	7
60-64	-	4	3	2	-	-	9
65-69	1	1	1	3	1	-	7
70-74	-	-	-	-	1	1	2
All Ages	52	24	13	7	2	1	99

Average age last birthday: 49.4 years

Average completed years of service: 5.9 years

Average salary: $148,500

Total payroll: $14,701,500

APPENDIX 10A

Pensioners* as at 31 December 1991

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	97,900	294,000
60-64	1	55,000	55,000	7	98,800	692,000
65-69	7	105,400	738,000	8	101,600	813,000
70-74	14	101,400	1,420,000	7	84,100	589,000
75-79	59	98,600	5,817,000	7	85,700	600,000
80-84	45	85,800	3,861,000	1	89,000	89,000
85-89	23	88,800	2,042,000	-	-	-
90-94	7	101,000	707,000	-	-	-
95-99	1	56,000	56,000	-	-	-
All Ages	157	93,605	14,696,000	33	93,242	3,077,000

Average age last birthday: 79.5 years   Average age last birthday: 68.4 years

* All pensioners but one are males.

** Amounts reflect accrued indexation (per the Supplementary Retirement Benefits Act) to and including 1 January 1992.

APPENDIX 10B

Eligible Survivors* as at 31 December 1991

Age Last Birthday	Number	Yearly Amounts** Average ($)	Yearly Amounts** Total ($)
15-19	3	13,000	39,000
20-24	8	9,900	79,000
25-39	0	-	-
40-44	1	49,000	49,000
45-49	1	49,000	49,000
50-54	2	48,800	98,000
55-59	7	44,600	312,000
60-64	24	45,000	1,080,000
65-69	36	44,400	1,598,000
70-74	34	44,600	1,516,000
75-79	47	41,700	1,960,000
80-84	41	39,100	1,603,000
85-89	41	37,000	1,517,000
90-94	10	38,900	389,000
95-99	6	32,300	194,000
All Ages	261	40,165	10,483,000

Average age last birthday of children: 19.7 years

Average age last birthday of spouses: 75.9 years

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* All are widows except for the 11 eligible children under age 25.

** Amounts reflect accrued indexation (per the Supplementary Retirement Benefits Act) to and including 1 January 1992.