



Actuarial Bulletin No. 1

March 2008

The Registered Plans Directorate will be amending Actuarial Bulletin No. 1. To ensure consistency in determining the actuarial increase resulting from lifetime retirement benefits (LRBs) becoming payable after age 65, Example 3 of Appendix 1 will be removed. As a result, Example 2 will be modified to clearly demonstrate how two plan members with the same age, earnings and employment history will have the same LRBs, actuarial liability and current service costs, whether the benefits were accrued on a current service basis or bought back after attaining age 65.

Although these changes will be made at a later date, the RPD will accept actuarial valuation reports using the revised methodology prior to the publication of the revised Bulletin.

The Registered Plans Directorate (RPD) presents its first bulletin about actuarial issues in defined-benefit pension plans and how the provisions of the *Income Tax Act* (the "Act") and *Income Tax Regulations* (the "Regulations") apply to these issues.

In this inaugural bulletin, we will communicate our position on the methodology (acceptable to RPD) involved in calculating the actuarial increase on delayed retirement where pension commencement is postponed beyond age 65.

Specifically, we will outline the following:

- the RPD's interpretation of paragraph 8504(10)(b) of the Regulations for actuarially adjusted benefits that can be considered excluded lifetime retirement benefits (LRBs) for purposes of the maximum LRB payable under a defined benefit registered pension plan (RPP), as per subsection 8504(1) of the Regulations;
- the date at which the above legislative interpretation will be applied; and
- the intended treatment of actuarial valuation reports not yet approved, submitted before the above date, and in which we find LRBs adjusted for delayed retirement using a less-restrictive methodology than that set out in this document.

Note:

Due to the technical nature of this publication, it is intended primarily for use by pension plan consultants and actuaries who have an interest in tax matters.

Actuarial Increase on Delayed Retirement

General

Paragraph 8504(10)(b) of the Regulations permits certain additional LRBs, on account of deferral of pension commencement beyond age 65, to be disregarded in determining whether LRBs are in compliance with the conditions in subsection 8504(1) of the Regulations.

The paragraph stipulates that an adjustment can be made to offset, in whole or in part, the decrease in the value of the LRBs that would otherwise result by reason of the deferral of such benefits after the member attains 65 years of age. It requires that the adjustment is not more favourable than such an adjustment made on an actuarially equivalent basis. The additional LRBs resulting from the above adjustment can be disregarded for purposes of subsection 8504(1) of the Regulations.

Therefore, for plan members who elect to defer receiving their LRBs beyond age 65, the maximum LRB that can be paid from a pension plan is the maximum set out under subsection 8504(1) plus an additional LRB as per paragraph 8504(10)(b). The additional LRB compensates the member for the decrease in value of the pension benefits on account of the deferral of the payment of pension benefits beyond age 65. For illustration purposes, we assume the normal retirement age (NRA) is 65. The plan member, currently age 69, is expected to have accrued LRBs at the maximum accrual rate pursuant to subsection 8504(1) for each year of pensionable service. The plan permits LRBs to be adjusted on an actuarial equivalent basis if the retirement date is delayed beyond age 65. The plan member is assumed to retire at age 69 (i.e., postponed retirement age).

In the formulae below, i represents the interest rate, $\ddot{a}_r^{(12)}$ the present value of one unit of LRB payable monthly from age r , v_i^{r-x} the discount factor from age x to age r at an interest rate of i , B_x represents the accrued LRB at age x , $B_x^{Svc < y}$ represents LRB at age x for periods of service before age y , and $b_x^{z \leq Svc < z+1}$ the LRB at age x for the period of service between ages z and $z+1$.

LRB accrued for periods of service before age 65.

For this LRB, the "decrease in value" on account of delayed retirement from 65 to 69 is determined as:

$$\text{Decrease in value} = \max(0, B_{65} \times \ddot{a}_{65}^{(12)} \times (1+i)^{69-65} - B_{69}^{Svc < 65} \times \ddot{a}_{69}^{(12)})$$

Therefore, the LRB payable pursuant to paragraph 8504(10)(b), if any, in addition to LRBs payable pursuant to subsection 8504(1) from age 69 is equal to:

$$\max(0, B_{65} \times \frac{\ddot{a}_{65}^{(12)}}{\ddot{a}_{69}^{(12)}} \times (1 + i)^{69 - 65} - B_{69}^{Svc < 65})$$

The total amount of LRB payable as of the postponed retirement age is equal to:

$$B_{69}^{Svc < 65} + \max(0, B_{65} \times \frac{\ddot{a}_{65}^{(12)}}{\ddot{a}_{69}^{(12)}} \times (1 + i)^{69 - 65} - B_{69}^{Svc < 65})$$

$$B_{65} \times (1 + i)^{69 - 65} \times \frac{\ddot{a}_{65}^{(12)}}{\ddot{a}_{69}^{(12)}} \text{ (if the term in parenthesis is } > 0)$$

or $B_{69}^{Svc < 65}$ (otherwise)

LRBs accrued beyond age 65

It is important to note that LRBs cannot be deferred (postponed) until they are earned for the purposes of paragraph 8504(10)(b). Otherwise stated, the deferral period starts from the later of the normal retirement date (no earlier than age 65) or the time from which the member has earned the LRBs, to the postponed retirement date.

For the sake of simplicity, LRBs are deemed to be earned uniformly during the year. As a result, a mid-year adjustment is applied for the additional LRBs pursuant to paragraph 8504(10)(b). This results in the following:

(i) Accrual of LRB from age 65 to age 66

As to the LRB earned for the period of service between ages 65 and 66, the “decrease in value” on account of delayed retirement is calculated from 65.5 to 69 as:

$$\text{Decrease in value} = \max(0, b_{66}^{65 \leq Svc < 66} \times \ddot{a}_{65.5}^{(12)} \times (1 + i)^{69 - 65.5} - b_{69}^{65 \leq Svc < 66} \times \ddot{a}_{69}^{(12)})$$

The total amount payable as of the postponed retirement age is equal to

$$b_{66}^{65 \leq Svc < 66} \times (1 + i)^{69 - 65.5} \times \frac{\ddot{a}_{65.5}^{(12)}}{\ddot{a}_{69}^{(12)}}$$

or

$$b_{69}^{65 \leq Svc < 66}$$

(ii) Accrual of LRB from age 66 to age 67

As to the LRB earned for service between ages 66 and 67, the “decrease in value” on account of delayed retirement is calculated from 66.5 to 69 as:

$$\text{Decrease in value} = \max(0, b_{67}^{66 \leq \text{Svc} < 67} x \ddot{a}_{66.5}^{(12)} x (1 + i)^{69 - 66.5} - b_{69}^{66 \leq \text{Svc} < 67} x \ddot{a}_{69}^{(12)})$$

And the total amount payable as of the postponed retirement age is equal to:

$$b_{67}^{66 \leq \text{Svc} < 67} x (1 + i)^{69 - 66.5} x \frac{\ddot{a}_{66.5}^{(12)}}{\ddot{a}_{69}^{(12)}}$$

or

$$b_{69}^{66 \leq \text{Svc} < 67}$$

(iii) Accrual of LRB from age 67 to age 68

As to the LRB earned for service between ages 67 and 68, the “decrease in value” on account of delayed retirement is calculated from 67.5 to 69 as:

$$\text{Decrease in value} = \max(0, b_{68}^{67 \leq \text{Svc} < 68} x \ddot{a}_{67.5}^{(12)} x (1 + i)^{69 - 67.5} - b_{69}^{67 \leq \text{Svc} < 68} x \ddot{a}_{69}^{(12)})$$

And the total amount payable as of the postponed retirement age is equal to:

$$b_{68}^{67 \leq \text{Svc} < 68} x (1 + i)^{69 - 67.5} x \frac{\ddot{a}_{67.5}^{(12)}}{\ddot{a}_{69}^{(12)}}$$

or

$$b_{69}^{67 \leq \text{Svc} < 68}$$

(iv) Accrual of LRB from age 68 to age 69

As to the LRB earned for service between ages 68 and 69, the “decrease in value” on account of delayed retirement is calculated from 68.5 to 69 as:

$$\text{Decrease in value} = b_{69}^{68 \leq \text{Svc} < 69} x \ddot{a}_{68.5}^{(12)} x (1 + i)^{69 - 68.5} - b_{69}^{68 \leq \text{Svc} < 69} x \ddot{a}_{69}^{(12)}$$

And the total amount payable as of the postponed retirement age is equal to:

$$b_{69}^{68 \leq \text{Svc} < 69} x (1 + i)^{69 - 68.5} x \frac{\ddot{a}_{68.5}^{(12)}}{\ddot{a}_{69}^{(12)}}$$

It is evident from the formulas in (i), (ii), (iii), and (iv) above, that the actuarial adjustment results in different LRB amounts payable as of age 69 for;

- (a) LRBs earned up to age 65;
- (b) LRBs earned from age 65 to age 66;
- (c) LRBs earned from age 66 to age 67;
- (d) LRBs earned from age 67 to age 68; and
- (e) LRBs earned from age 68 to age 69;

due to the differing periods of adjustment in each case.

The examples set out in Appendix 1 will provide further insight into the acceptable actuarial adjustments on account of the delayed retirement pursuant to paragraph 8504(10)(b) of the Regulations.

For career average and final average earnings plans, the actuarially adjusted LRB on account of delayed retirement must not be calculated using earnings during the deferral period. Similarly, earnings must not be indexed beyond the calendar year during which the deferral period starts for the purposes of subsection 8504(10)(b), otherwise a form of double counting is introduced. This is not acceptable to the RPD.

Pension Credits

For the purposes of determining the pension credits as per subsection 8301(6) of the Regulations, paragraphs 8302(3)(n) and 8303(5)(d) allow the LRB increases, due to the deferral of pension onset, to be disregarded to the extent that they would not be more than the increases determined on an actuarial equivalent basis. When the increase in LRB exceeds the actuarial increase acceptable to RPD, the normalized pension attributable to the year for which the pension credit is calculated will be correspondingly higher, and the increases for prior years' benefits will be a past service event that will give rise to a past service pension adjustment (PSPA).

Specifically, the PSPA will be based on the portion of the LRB increase that exceeds the actuarial equivalence on account of delayed retirement acceptable to RPD. If the acceptable actuarial increase was 7 percent and a 10 percent increase in the LRB is provided, the PSPA would be based on the additional 3 percent increase in LRB.

Effective date of above interpretation

We will apply the above interpretation prospectively, effective May 1, 2008. The legislative interpretation of 8504(10)(b) outlined above will prove to be more restrictive than the methodology currently used by some industry practitioners when valuing the actuarial liabilities and even the costs for plan members covered under designated pension plans (defined under subsection 8515(1) of the Regulations) who have elected to defer the receipt of their pension benefits beyond age 65.

The valuation reports received in the RPD before May 1, 2008, will not be adversely affected by this interpretation. Retired members who have already started to receive their LRBs at the above date will not have their benefits reduced.

However, for any valuation reports that the RPD has not yet received before May 1, 2008, we will enforce this interpretation as part of our review of the pension plan funding requests, as well as on compliance audits.

How to contact us

Contact us at the Registered Plans Directorate if you have any questions about this interpretation. Our telephone enquiries service is available Monday to Friday from 8:00 a.m.

to 5:00 p.m., Eastern Time (with a voice mailbox system to take messages outside those hours):

In the Ottawa area:

For service in English, call 613-954-0419

For service in French, call 613-954-0930

Toll free elsewhere in Canada:

For service in English, call 1-800-267-3100

For service in French, call 1-800-267-5565

- Actuaries and plan administrators who need guidance on issues related to a specific plan can write to us at the Registered Plans Directorate, Ottawa, ON K1A 0L5, or fax us at (613) 952-0199.
- We welcome feedback on this bulletin. Send your comments by email to: rpd/dre@cra-arc.gc.ca

Appendix 1

Example 1

An individual participates in a single-employer defined benefit RPP.

The individual's pensionable earnings have been historically lower than what is required to yield the 8504(1) maximum LRB from the plan.

The member entered the plan on January 1, 1997, turned 65 as of January 1, 2005, and has decided to delay his retirement. A valuation is being prepared with an effective date of January 1, 2007.

Plan Provisions

Effective date:	January 1, 1991
Benefit formula:	Minimum of 1.5% of final year average earnings (FAE3), or the defined benefit limit times the years of credited service
Normal retirement age:	65
Normal form of pension:	Life only
Post Retirement indexing:	Fully indexed to CPI
Provision of DB Limit projection:	Yes
Actuarial equivalence on account of delayed retirement:	Yes

Employee Data

Shareholder (Y/N):	No; (non-connected person)
Sex:	Male
Date of birth:	January 1, 1940
Date of hire:	January 1, 1997
Attained age:	67
Pensionable service:	10 years

	Earnings	FAE3 (at January 1)
1997-2004	\$50,000	
2005	\$55,000	\$50,000
2006	\$60,000	\$51,667
2007 (expected)	\$62,400	\$55,000
2008 (expected)	\$64,896	\$59,133
2009		\$62,432

Actuarial Assumptions

Valuation date:	January 1, 2007
Valuation rate (before retirement):	$i = 6\%$
Salary increase:	$s = 4\%$
Inflation rate (i.e. CPI):	2.50%
Indexation of pension:	CPI %
Valuation rate (after retirement):	$i' = 3.41\% (1.06/1.025 - 1)$
DB Limit projection rate:	3% per annum commencing January 1, 2010
Mortality table:	UP94 projected to 2015 with scale AA (post-retirement only)
Retirement Date:	January 1, 2009
Retirement age:	69
Funding method:	Projected Accrued Benefit
Payment mode of retirement benefits:	Monthly, in advance
Mode of payment of NC:	Lump sum at the beginning of the year

Review

LRB accrued at age 65 and payable as of January 1, 2005:

$$\begin{aligned} &= 1.5\% \times \$50,000 \times 8 \\ &= \$6,000 \end{aligned}$$

LRB accrued at age 66 for service between ages 65 and 66 and payable as of January 1, 2006:

$$\begin{aligned} &= 1.5\% \times \$51,667 \times 1 \\ &= \$775 \end{aligned}$$

LRB accrued at age 67 for service between ages 66 and 67 and payable as of January 1, 2007:

$$\begin{aligned} &= 1.5\% \times \$55,000 \times 1 \\ &= \$825 \end{aligned}$$

LRB projected to age 68 for service between ages 67 and 68 and payable as of January 1, 2008:

$$\begin{aligned} &= 1.5\% \times \$59,133 \times 1 \\ &= \$887 \end{aligned}$$

LRB projected to age 69 for service between ages 68 and 69 and payable as of January 1, 2009:

$$\begin{aligned} &= 1.5\% \times \$62,432 \times 1 \\ &= \$936 \end{aligned}$$

Total projected LRB to retirement date for all years of service:

$$= 1.5\% \times \$62,432 \times 12$$

$$= \$11,238$$

Projected LRB to retirement date for years of service before January 1, 2005:

$$= 1.5\% \times \$62,432 \times 8$$

$$= \$7,492$$

The actuarial liability (AL) as at the valuation date is determined as follows:

$$AL_{@1/1/2007} =$$

$$((\$7,492 + \max(0; \$6,000 \times (1+i)^{69-65} \times \frac{\ddot{a}_{65@i}^{(12)}}{\ddot{a}_{69@i}^{(12)}} - \$7,492)) + (\$936 + \max(0; \$775 \times (1+i)^{69-65.5} \times \frac{\ddot{a}_{65.5@i}^{(12)}}{\ddot{a}_{69@i}^{(12)}} - \$936)) + (\$936 + \max(0; \$825 \times (1+i)^{69-66.5} \times \frac{\ddot{a}_{66.5@i}^{(12)}}{\ddot{a}_{69@i}^{(12)}} - \$936))) \times \ddot{a}_{69@i}^{(12)} \times v_i^{69-67}$$

The normal costs are computed as follows:

$$NC_{\text{for year 2007}} = (\$936 + \max(0; \$887 \times (1+i)^{69-67.5} \times \frac{\ddot{a}_{67.5@i}^{(12)}}{\ddot{a}_{69@i}^{(12)}} - \$936)) \times \ddot{a}_{69@i}^{(12)} \times v_i^{69-67}$$

$$NC_{\text{for year 2008}} = (\$936 + \max(0; \$936 \times (1+i)^{69-68.5} \times \frac{\ddot{a}_{68.5@i}^{(12)}}{\ddot{a}_{69@i}^{(12)}} - \$936)) \times \ddot{a}_{69@i}^{(12)} \times v_i^{69-68}$$

Example 2

An individual participates in a single-employer defined benefit RPP.

The individual's pensionable earnings have been historically higher than what is required to yield the 8504(1) maximum LRB from the plan.

The member entered the plan on January 1, 1997, turned 65 as of January 1, 2005, and has decided to delay his retirement. A valuation is being prepared with an effective date of January 1, 2007.

Plan Provisions

Effective date:

January 1, 1991

Benefit formula:

2.0% of indexed earnings for each calendar year

Normal retirement age:	65
Normal form of pension:	Joint and survivor with $66\frac{2}{3}\%$ survivor pension and guaranteed for 5 years
Post Retirement indexing:	Fully indexed to CPI
Provision of DB Limit projection:	Yes
Actuarial equivalence on account of delayed retirement:	Yes

Employee Data

Shareholder (Y/N):	Yes; (connected person)
Sex:	Male
Date of birth:	January 1, 1940
Date of hire:	January 1, 1997
Attained age:	67
Pensionable service:	10 years
Earnings:	Maximum for all years

Actuarial Assumptions

Valuation date:	January 1, 2007
Valuation rate (before retirement):	$i = 7.5\%$
Salary increase:	$s = 5.5\%$
Inflation rate (i.e. CPI):	4.0%
Indexation of pension:	CPI-1 %
Valuation rate (after retirement):	$i' = 4.37\% (1.075/1.03 - 1)$
DB Limit projection rate:	5.5% per annum commencing January 1, 2010
Mortality table:	GAM83 Unisex 50% males & 50% females, 80% mortality rates (post-retirement only)
Retirement Date:	January 1, 2009
Retirement age:	69
Spouse's age:	Same as member
Funding method:	Projected Accrued Benefit
Payment mode of retirement benefits:	Monthly, in advance
Mode of payment of NC:	Lump sum at the beginning of the year

Review

LRB accrued at age 65 and payable as of January 1, 2005:

$$= \$2,000 \times 8$$

$$= \$16,000$$

LRB accrued at age 66 for service between ages 65 and 66 and payable as of January 1, 2006:

$$= \$2,111$$

LRB accrued at age 67 for service between ages 66 and 67 and payable as of January 1, 2007:

$$= \$2,222$$

LRB projected to age 68 for service between ages 67 and 68 and payable as of January 1, 2008:

$$= \$2,333$$

LRB projected to age 69 for service between ages 68 and 69 and payable as of January 1, 2009:

$$= \$2,444$$

Total projected LRB to retirement date for all years of service:

$$= \$2,444 \times 12$$

$$= \$29,328$$

Projected LRB to retirement date for years of service before January 1, 2005:

$$= \$2,444 \times 8$$

$$= \$19,552$$

AL_{@1/1/2007} =

$$((\$19,552 + \max(0; \$16,000 \times (1+i)^{69-65}) \times \frac{\ddot{a}_{65:65.5|}^{(12)}@i}{\ddot{a}_{69:69.5|}^{(12)}@i} - \$19,552)) +$$

$$(\$2,444 + \max(0; \$2,111 \times (1+i)^{69-65.5}) \times \frac{\ddot{a}_{65.5:65.5|}^{(12)}@i}{\ddot{a}_{69:69.5|}^{(12)}@i} - \$2,444)) +$$

$$(\$2,444 + \max(0; \$2,222 \times (1+i)^{69-66.5}) \times \frac{\ddot{a}_{66.5:66.5|}^{(12)}@i}{\ddot{a}_{69:69.5|}^{(12)}@i} - \$2,444)) \times \ddot{a}_{69:69.5|}^{(12)}@i \times v_i^{69-67}$$

NC for year 2007 =

$$(\$2,444 + \max(0; \$2,333 \times (1+i)^{69-67.5}) \times \frac{\ddot{a}_{67.5:67.5|}^{(12)}@i}{\ddot{a}_{69:69.5|}^{(12)}@i} - \$2,444)) \times \ddot{a}_{69:69.5|}^{(12)}@i \times v_i^{69-67}$$

NC for year 2008 =

$$(\$2,444 + \max(0; \$2,444 \times (1+i)^{69-68.5} \times \frac{\ddot{a}_{68.5:68.5:\overline{5}|@i}^{(12)}}{\ddot{a}_{69:69:\overline{5}|@i}^{(12)}} - \$2,444)) \times \ddot{a}_{69:69:\overline{5}|@i}^{(12)} \times v_i^{69-68}$$

Example 3

A single-employer defined benefit RPP is established effective January 1, 2007.

The individual has been employed with the company for ten years and has had earnings that have been historically higher than what is required to yield the 8504(1) maximum LRB from the plan.

The individual is currently age 67 and has decided to delay her retirement. A valuation is being prepared with an effective date of January 1, 2007.

Plan Provisions

Effective date:	January 1, 2007
Benefit formula:	2% of indexed compensation for each year of service
Normal retirement age:	65
Normal form of pension:	Joint and survivor with $66\frac{2}{3}\%$ survivor pension and guaranteed for 5 years
Post Retirement indexing:	Fully indexed to CPI minus 1%
Provision of DB Limit projection:	Yes
Actuarial equivalence on account of delayed retirement:	Yes

Employee Data

Shareholder (Y/N):	Yes; (connected person)
Sex:	Female
Date of birth:	January 1, 1940
Attained age:	67
Pensionable past service:	10 years
Salary:	\$130,000 for each year of service
Accrued pension:	\$22,222 per annum

Actuarial Assumptions

Valuation date:	January 1, 2007
Valuation rate (before retirement):	7.5%
Salary increase:	5.5%
Inflation rate (i.e. CPI):	4.0%
Indexation of pension:	CPI - 1%
Valuation rate (after retirement):	$i' = 4.37\%$ (1.075/1.03 - 1)
DB Limit projection rate:	5.5% % per annum commencing January 1, 2010
Mortality table:	GAM83 Unisex 50% males & 50% females 80% mortality rates (post-retirement only)
Retirement Date:	January 1, 2009
Retirement age:	69
Spouse age:	Same age as member

Funding method:	Projected Accrued Benefit
Payment mode of retirement benefits:	Monthly, in advance
Mode of payment of CSC:	Lump sum at the beginning of the year

Review

LRB accrued at age 67 and payable as of January 1, 2007:

$$= \$2,222 \times 10$$

$$= \$22,220$$

Projected LRB to age 68 for service between ages 67 and 68 and payable as of January 1, 2008:

$$= \$2,333$$

Projected LRB to age 69 for service between ages 68 and 69 and payable as of January 1, 2009:

$$= \$2,444$$

Total projected LRB to retirement date for all years of service:

$$= \$2,444 \times 12$$

$$= \$29,328$$

Projected LRB to retirement date for years of service before January 1, 2007:

$$= \$2,444 \times 10$$

$$= \$24,440$$

AL @1/1/2007 =

$$(\$24,440 + \max(0; \$22,220 \times (1+i)^{69-67} \times \frac{\ddot{a}_{67:67.5|}^{(12)}@i}{\ddot{a}_{69:69.5|}^{(12)}@i} - \$24,440)) \times \ddot{a}_{69:69.5|}^{(12)}@i \times v_i^{69-67}$$

NC for year 2007 =

$$(\$2,444 + \max(0; \$2,333 \times (1+i)^{69-67.5} \times \frac{\ddot{a}_{67.5:67.5|}^{(12)}@i}{\ddot{a}_{69:69.5|}^{(12)}@i} - \$2,444)) \times \ddot{a}_{69:69.5|}^{(12)}@i \times v_i^{69-67}$$

NC for year 2008 =

$$(\$2,444 + \max(0; \$2,444 \times (1+i)^{69-68.5} \times \frac{\ddot{a}_{68.5:68.5|}^{(12)}@i}{\ddot{a}_{69:69.5|}^{(12)}@i} - \$2,444)) \times \ddot{a}_{69:69.5|}^{(12)}@i \times v_i^{69-65}$$