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Educational Note

Assumptions for Hypothetical Wind-Up and Solvency Valuations with Effective Dates between December 31, 2013, and December 30, 2014

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Educational Note

Assumptions for Hypothetical Wind-Up and Solvency Valuations with Effective Dates Between December 31, 2013, and December 30, 2014

Committee on Pension Plan Financial Reporting

April 2014

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Members should be familiar with educational notes. Educational notes describe but do not recommend practice in illustrative situations. They do not constitute standards of practice and are, therefore, not binding. They are, however, intended to illustrate the application (but not necessarily the only application) of the Standards of Practice, so there should be no conflict between them. They are intended to assist actuaries in applying standards of practice in respect of specific matters. Responsibility for the manner of application of standards of practice in specific circumstances remains that of the members.

Memorandum

To: All Pension Actuaries

From: Bruce Langstroth, Chair
Practice Council

Manuel Monteiro, Chair
Committee on Pension Plan Financial Reporting

Date: April 26, 2014

Subject: **Educational Note—Assumptions for Hypothetical Wind-Up and Solvency Valuations with Effective Dates between December 31, 2013, and December 30, 2014**

This educational note provides guidance on assumptions to be used for hypothetical wind-up and solvency valuations for 2014. It confirms the initial guidance for 2014 assumptions that was provided in an educational note supplement issued on January 24, 2014.

Over the last two years, the Committee on Pension Plan Financial Reporting (PPFRC) reviewed several aspects of group annuity purchase pricing and significant revisions to the guidance were made effective June 30, 2013. The key changes to the guidance, which are maintained in this year-end guidance, are:

- The cost of purchasing non-indexed annuities is to be estimated using the duration of the liabilities expected to be settled through the purchase of annuities; and
- The cost of purchasing annuities that are fully indexed to Consumer Price Index (CPI) increases is to be estimated using a discount rate less than the yield on Government of Canada real-return long-term bonds.

In accordance with the Institute's Policy on Due Process for the Approval of Guidance Material Other than Standards of Practice, this educational note has been prepared by the PPFRC and has received final approval for distribution by the Practice Council effective April 18, 2014.

As outlined in subsection 1220 of the Standards of Practice, "*The actuary should be familiar with relevant Educational Notes and other designated educational material*." That subsection explains further that a "practice that the Educational Notes describe for a situation is not necessarily the only accepted practice for that situation and is not necessarily accepted actuarial practice for a different situation." As well, "Educational Notes are intended to illustrate the application (but not necessarily the only application) of the standards, so there should be no conflict between them."

The PPFRC would like to express its gratitude to BMO Assurance, the Co-Operators, Desjardins Financial Security, Great-West Life, Industrial Alliance, Manulife, Standard Life, and Sun Life for providing the committee with data.

Questions or comments regarding this educational note may be directed to Manuel Monteiro at manuel.monteiro@mercer.com.

BL, MM

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1. INTRODUCTION

According to paragraph 3330.16 of the Standards of Practice, the assumptions used for actual and hypothetical wind-up valuations would:

- In respect of benefit entitlements that are assumed to be settled by purchase of annuities, reflect single premium annuity rates;
- In respect of benefit entitlements that are assumed to be settled by lump sum transfer, reflect the standards in section 3500 respecting commuted values; and
- In respect of benefit entitlements that are assumed to be settled in some other manner, reflect the manner in which such benefits would be settled.

This document has been prepared by the Committee on Pension Plan Financial Reporting (PPFRC) and is intended to provide actuaries with guidance in selecting appropriate assumptions for hypothetical wind-up and solvency valuations in respect of benefit entitlements that are assumed to be settled by purchase of annuities or by lump sum transfer with effective dates on or after December 31, 2013, and prior to or on December 30, 2014. For greater clarity, this document does not provide detailed guidance on selecting appropriate assumptions for hypothetical wind-up and solvency valuations in respect of benefit entitlements that are assumed to be settled in a manner other than the purchase of annuities or lump sum transfer. Actuaries may refer to the educational note Alternative Settlement Methods for Hypothetical Wind-Up and Solvency Valuations in this case.

This educational note confirms the initial guidance for 2014 assumptions that was provided in an educational note supplement issued on January 24, 2014.

2. SETTLEMENT METHODS

To comply with paragraph 3330.16 of the Standards of Practice, the actuary would make an assumption for each class of plan members as to the portion of liabilities settled by annuity purchase, commuted value transfer, or other manner of settlement. Typically, classes of plan members would include at least:

- Active members not eligible for retirement;
- Active members eligible for retirement;
- Retired members and surviving spouses; and
- Deferred vested members.

In determining the appropriate assumption for the method of settlement, the actuary would consider:

- Any legislative requirements to offer specific settlement options to various classes of members;
- The settlement provisions of the plan and, in particular, the options to be provided to members upon plan wind-up;
- The benefit provisions of the plan, for example:

  - Where a plan has generous ancillary benefits, an election to receive a commuted value transfer may be affected by the maximum transfer limits imposed under section 8517 of the *Income Tax Regulations (Canada)*; or
  - Where a plan has inflexible retirement options and few optional forms of payment, a member may prefer to elect a commuted value transfer to increase flexibility in payment terms;
- The postulated scenario upon which the hypothetical wind-up is based;
- Past experience of the plan, when relevant; and
- Any experience from actual wind-ups of comparable plans of which the actuary may be aware.

All requirements of the Standards of Practice with respect to the development and reporting of assumptions would apply to this assumption.

3. BENEFITS ASSUMED TO BE SETTLED BY LUMP SUM TRANSFER

For hypothetical wind-up valuations, of which solvency valuations are a subset, paragraph 3240.05 of the Standards of Practice states: "*For a hypothetical wind-up valuation, the actuary may assume that the wind-up date, the calculation date and the settlement date are coincident.*"

Although the Standards of Practice contemplate that the wind-up date may differ from the calculation date, this would only apply if the valuation contemplates that benefits will be settled through the use of an alternative settlement method. Accordingly, the hypothetical wind-up liabilities for benefits expected to be settled through the payment of a lump sum transfer would be determined in accordance with section 3500 of the Standards of Practice, applying the assumptions consistent with the particular valuation date.

4. BENEFITS ASSUMED TO BE SETTLED BY PURCHASE OF NON-INDEXED GROUP ANNUITIES

Methodology

The PPFRC began collecting data from insurers on a quarterly basis in 2009. Initially, six insurers agreed to provide hypothetical quotes, on a confidential basis, on illustrative blocks of business. The insurers that agreed to provide this information were Desjardins Financial Security, Great-West Life, Industrial Alliance, Manulife, Standard Life, and Sun Life Financial. In late 2011, two additional insurers, BMO Assurance and the Co-Operators, also agreed to provide hypothetical quotes on the same basis.

Between 2009 and 2013, the PPFRC prepared data for two illustrative blocks of business for non-indexed pensions that were then provided to the insurers. One illustrative block was intended to be representative of a large purchase (i.e., with a total premium greater than $15 million) and the other illustrative block was intended to be representative of a small purchase (i.e., with a total premium less than $15 million).

Over the 18-month period ending June 30, 2013, the PPFRC conducted extensive research and analysis on various aspects of the group annuity market. Based on this research, the PPFRC concluded that the duration of the liabilities expected to be settled through the purchase of annuities is a more important determinant of the cost of

purchasing non-indexed annuities than the size of the purchase or the distribution of the liabilities by deferred vested/pensioner.

Consequently, the PPFRC developed new illustrative blocks of business of three different durations and obtained hypothetical quotes on these blocks. This new methodology was first implemented for the quarter ending June 30, 2013, and contributed towards establishing the guidance issued effective June 30, 2013. The characteristics of the three illustrative blocks are as follows:

Duration	**Low**	**Medium**	**High**
Duration at December 31, 2013	7.6	9.9	12.1
Approximate premium at December 31, 2013	$15 million	$20 million	$21 million
Average monthly pension	$897	$897	$897
Proportion of liability for deferred members	0%	4%	12%

For the purpose of this guidance, the durations of the illustrative blocks shown above were calculated using the following formula:

[(Estimated Purchase Price at 3.83% / Estimated Purchase Price at 3.84%) – 1] / 0.01%

where 3.83% is equal to the CANSIM V39062 yield of 3.13% plus 70 bps at December 31, 2013, being the guidance for the illustrative block with medium duration (as described below). Note that the durations of the three illustrative blocks will change over time as discount rates change.

The guidance contained in this educational note is partially based on hypothetical quotes provided by the eight insurance companies on illustrative group annuity business using pricing conditions as at December 31, 2013. These data were collected on the same basis as the hypothetical quotes as at June 30, 2013, and September 30, 2013. The insurers provided quotes that they have indicated are realistic (i.e., as though the quotes truly represent blocks of business on which they are bidding) as of the agreed-upon dates. Based on the quotes, the PPFRC then calculated the implicit discount rate underlying each quote in conjunction with the UP94 generational mortality table (with the AA improvement scale).

The insurers have indicated that it is not appropriate, for competitive reasons, for the PPFRC to disclose the individual discount rates underlying the insurer quotes, including the discount rate associated with the most competitive quote. Also, the insurers have indicated that in their view it is not appropriate to rely solely on the most competitive hypothetical quote for purposes of establishing group annuity purchase discount rate assumptions because the capacity at which group annuities can be transacted at the best illustrative price might be limited. For example, a particular insurer may not be transacting actual sales at a particular date, even though hypothetical quotes are provided at that date, if the insurer has met its capacity limit.

After lengthy discussions, the PPFRC and the insurers agreed that, for purposes of providing guidance on group annuity purchase discount rates, it would be appropriate to

reference the average of the discount rates for the three most competitive hypothetical quotes. In reaching this conclusion, the PPFRC considers the magnitude of the spread between the confidential hypothetical quotes.

Consistent with the analysis performed at previous quarter-ends, the hypothetical quote information was supplemented with data on the pricing of actual group annuity purchases during the fourth quarter of 2013, as provided by certain actuarial consulting firms.

Analysis

The table below provides the implicit discount rates as at December 31, 2013 underlying the average of the three most competitive hypothetical quotes, determined in conjunction with the UP94 generational mortality tables (with the AA improvement scale), and the spread of these implicit discount rates over the unadjusted average yield on Government of Canada marketable bonds with maturities over 10 years (CANSIM V39062). Comparable information is also shown as at September 30, 2013.

AVERAGE OF THE THREE MOST COMPETITIVE HYPOTHETICAL QUOTES (USING UP94 GENERATIONAL MORTALITY TABLES)						
	30/09/2013			**31/12/2013**		
	Low duration	**Medium duration**	**High duration**	**Low duration**	**Medium duration**	**High duration**
Discount rate	3.56%	3.79%	3.90%	3.65%	3.88%	3.98%
Spread over CANSIM V39062	+ 59 bps	+ 82 bps	+ 93 bps	+ 52 bps	+ 75 bps	+ 85 bps

The spread over CANSIM V39062 based on the average of the best three hypothetical quotes decreased by 7 or 8 bps for each of the illustrative blocks. However, there was significant variability in the hypothetical quotes provided by the individual insurers, with the spreads for most insurers decreasing by significantly more than 8 bps at December 31 compared to September 30.

The data obtained on actual annuity purchases during the fourth quarter were generally consistent with the above results.

Guidance for Non-Indexed Pensions

As a result of this analysis, the PPFRC has concluded that effective December 31, 2013, the cost of purchasing non-indexed annuities would be estimated based on the duration of the liabilities expected to be settled through the purchase of annuities. The process for estimating the cost of purchasing non-indexed annuities would be as follows:

1. Determine the duration *of the portion of the liabilities assumed to be settled through the purchase of annuities*, based on the impact of a change in discount rate from 3.83% (CANSIM V39062 plus 70 bps at December 31, 2013).
2. Using the duration obtained in step 1, interpolate using the following table to determine the appropriate spread above unadjusted CANSIM V39062:

Illustrative block	Duration based on 3.83% discount rate	Spread above unadjusted CANSIM V39062
Low duration	7.6	+ 50 bps
Medium duration	9.9	+ 70 bps
High duration	12.1	+ 80 bps

If the duration of the portion of the liabilities assumed to be settled through the purchase of annuities is lower than 7.6 or higher than 12.1, the actuary would make a reasonable assumption regarding the appropriate spread.

The PPFRC believes that groups with durations higher than 12.1 would likely include a large proportion of deferred vested members. While the higher duration, in isolation, would be expected to result in lower pricing, the PPFRC believes that this would be offset by added administrative costs and risk premiums that insurers would price into the annuity. The PPFRC also believes that it is rare that a group would have a duration materially lower than 7.6. Therefore, as of December 31, 2013, the PPFRC believes that one reasonable approach would be to assume that the spread for durations lower than 7.6 is 50 bps, and the spread for durations higher than 12.1 is 80 bps. Other approaches may also be reasonable.

3. The cost of purchasing annuities would be estimated using an interest rate determined as the unadjusted CANSIM V39062 increased arithmetically by the spread calculated in step 2, in conjunction with the UP94 generational mortality tables.

   Each actuary would use discretion in determining whether to round the interest rate to the nearest 5 or 10 basis points. Consistency in the application of such rounding would be followed.

The above guidance applies to both immediate and deferred pensions and also applies regardless of the overall size of the group annuity purchase. It applies to valuations with effective dates on and after December 31, 2013, pending any further guidance or other evidence of change in annuity pricing.

Example

As at December 31, 2013, the unadjusted CANSIM V39062 was 3.13%; therefore the guidance for the medium duration would be 3.83% (i.e., + 70 bps). If the duration of the liabilities assumed to be settled through the purchase of annuities is determined to be 11 based on a change in discount rate from 3.83%, the appropriate spread above the unadjusted CANSIM V39062 would be determined as:

[Medium spread x (High duration – 11) + High spread x (11 – Medium duration)]/ [High duration – Medium duration]

[70 bps x (12.1 – 11) + 80 bps x (11 – 9.9)]/ [12.1 – 9.9] = 75 bps

Prior to rounding, an applicable underlying discount rate would then be determined as 3.13% + 0.75% = 3.88%.

5. INDEXED PENSIONS

Most of the contributing insurers have historically provided hypothetical quotes for the illustrative blocks used to develop previous guidance, determined as if the pensions were fully indexed to increases in the CPI. Prior to June 30, 2013, the hypothetical quotes for the illustrative blocks on a CPI-indexed basis were consistently higher than the guidance provided by prior educational notes.

In light of the above, the PPFRC conducted research on the CPI-indexed group annuity market. This research included discussions with insurers, including confirmation of their willingness to transact on the basis of the hypothetical quotes being provided as well as a review of the results received in a limited number of actual quotations for CPI-indexed annuities where the transaction did not proceed. The PPFRC is also aware that a significant CPI-indexed group annuity purchase occurred in the second quarter of 2013.

Analysis

Most of the contributing insurers also provided data on hypothetical quotes for the three new illustrative blocks on a CPI-indexed basis as at December 31, 2013. The hypothetical quotes as at September 30, 2013, and December 31, 2013, for the medium-duration illustrative block are summarized as follows:

AVERAGE OF THE THREE MOST COMPETITIVE HYPOTHETICAL QUOTES (USING UP94 GENERATIONAL MORTALITY TABLES)		
	30/09/2013	**31/12/2013**
Discount rate	0.09%	0.07%
Spread over CANSIM V39057	-104 bps	-118 bps

Based on the average of the best three hypothetical quotes, the spread below CANSIM V39057 increased by 14 bps for the medium-duration illustrative block. However, the spread below CANSIM V39057 for the most competitive hypothetical quotes as at December 31, 2013 were similar to the quotes as at September 30, 2013. Given that fewer insurers are actively participating in the CPI-indexed annuity market, the PPFRC decided to give greater weight to the most competitive hypothetical quotes (compared to the average of the best three hypothetical quotes) in developing the guidance for CPI-indexed annuities.

While there is some indication that the pricing of CPI-indexed annuities may also vary by duration, the PPFRC has concluded that there are insufficient data at this stage to introduce this level of refinement. Consequently, the guidance contained herein is applicable to CPI-indexed annuities regardless of their duration.

There were no quantitative data obtained on actual fully indexed annuity purchases during the fourth quarter of 2013.

Guidance for Fully CPI-Indexed Pensions

Based on the pricing received, the PPFRC has determined that an appropriate proxy for estimating the cost of purchasing a group annuity where pensions are fully indexed to the rate of change in the CPI would be determined using an interest rate equal to the unadjusted yield on Government of Canada real-return long-term bonds (CANSIM series

V39057) reduced arithmetically by 110 bps, in conjunction with the UP94 generational mortality tables (with the AA improvement scale).

Each actuary would use discretion in determining whether to round the interest rate to the nearest 5 or 10 basis points. Consistency in the application of such rounding would be followed.

The above guidance applies to both immediate and deferred pensions, regardless of the overall size of the group annuity purchase and regardless of duration. It applies to valuations with effective dates on and after December 31, 2013, pending any further guidance or other evidence of change in annuity pricing.

Example

As at December 31, 2013, the unadjusted yield on Government of Canada real-return long-term bonds (CANSIM series V39057) was 1.25%. Therefore, prior to rounding, an applicable underlying discount rate would be determined as 1.25% - 1.10% = 0.15%.

Partially Indexed Annuities

In situations where pensions are partially indexed, indexed to a measure other than the CPI, or contain a deferred component, the actuary would make appropriate provisions for such situations consistent with the guidance provided in this educational note.

The difference between the discount rate used to estimate the cost of a non-indexed annuity and the cost of a fully indexed annuity can be broken down into two components: the best estimate of future inflation, and an inflation risk premium. The inflation risk premium represents the additional cost of purchasing a fully indexed annuity over the cost that would be charged if the insurer priced indexed annuities based only on a fixed rate of indexation equal to the best estimate of future inflation. The risk premium exists in part due to insurers' difficulty in immunizing indexed annuities, the increased risk borne by insurers when providing indexed annuities, and the lack of a fully competitive market for indexed annuities. The actuary would normally consider both the best estimate of future inflation and the inflation risk premium in estimating the cost of a partially indexed annuity.

It would be appropriate to determine the best estimate of future inflation by comparing the unadjusted average yield on Government of Canada marketable bonds over 10 years (i.e. CANSIM series V39062) to the unadjusted yield on Government of Canada real-return long-term bonds (i.e. CANSIM series V39057). For example, as at December 31, 2013, the best estimate of future inflation would be 1.88%, determined by comparing the unadjusted CANSIM series V39062 yield of 3.13% to the unadjusted CANSIM series V39057 yield of 1.25%. Other approaches to determine the best estimate of future inflation may be reasonable.

It would be appropriate to determine the inflation risk premium as the difference remaining between the discount rate used to estimate the cost of non-indexed annuities and the discount rate used to estimate the cost of fully indexed annuities after accounting for the best estimate of future inflation. For example as at December 31, 2013, for an annuity with a duration of 11, the difference between discount rates for non-indexed and indexed annuities is 3.73% = 3.88% - 0.15%; therefore the inflation risk premium would be determined as 1.85% = 3.73% - 1.88%.

Where offsets, caps, or floors apply, the actuary would adjust the implicit discount rates otherwise applicable, based on the likelihood of these features causing a material change in the pension payable in any year. In determining the likelihood of the features causing a material change in the pension payable, the actuary would be guided by the current economic environment as well as long-term historical experience.

Since there are significant variations in the types of partially-indexed provisions and very limited data on actual purchases, it is not feasible to provide guidance that would apply in all possible circumstances. However, common indexation provisions are often based on one, or a combination, of the following four scenarios:

a) *Fixed rate increases*: if the pension increase is based on a fixed rate per year, the expected increase in the pension amounts payable is known. An appropriate discount rate would be equal to the discount rate determined as if the pension were not indexed, less the fixed increase percentage. For example, as at December 31, 2013, a 2% fixed indexation rate for an annuity with a duration of 11 would result in a discount rate of 1.88% (3.88% -2%).

b) *Percentage of CPI*: where the indexation is a percentage of CPI without any offsets, caps, or floors, the expected pension amounts payable can be allocated between a fully indexed pension and a non-indexed pension; an appropriate implicit discount rate may be determined as follows:

   (Indexation %) · Fully-indexed proxy + (1- Indexation %) · Non-indexed proxy

   For purposes of determining the non-indexed proxy in the above formula, the duration of the portion of the liabilities assumed to be settled through the purchase of annuities should be determined as if the pensions were *not* indexed.

   For example, for a plan that provides indexing based on 75% of the CPI increase without any offsets, caps, or floors, and where the duration of the group expected to be settled through the purchase of annuities (determined as if the pensions were not indexed) is 11, an appropriate discount rate as at December 31, 2013, would be determined as 75% · 0.15% + (1 - 75%) · 3.88% = 1.08%.

c) CPI, subject to a fixed cap: If the cap is relatively high compared to the best estimate of future inflation, the assumed discount rate would approach that of a fully indexed pension. If the cap is relatively low compared to the best estimate of future inflation, the assumed discount would approach that of a fixed rate increase where the fixed rate is equal to the cap. For caps that are neither relatively high nor relatively low, compared to the best estimate of future inflation, an appropriate discount rate would be equal to that of a non-indexed pension reduced by the best estimate of future inflation and a portion of the inflation risk premium. The higher the cap, the higher the portion of the inflation risk premium that would be reflected, due to the increased variability in the level of indexing that would be provided.

d) *CPI, less an offset:* An appropriate discount rate would be equal to that of a fully indexed pension increased by only a portion of the offset. Typically, the impact on the discount rate will be less than the full amount of the offset, in light of insurers' difficulty in immunizing the expected pension amounts and their need to

protect against inflation at higher levels. For example, if the best estimate of future inflation is moderately below the offset, it would not be reasonable to assume a discount rate equivalent to a non-indexed pension, as there would be a significant likelihood that the inflation rate would exceed the offset in a number of years, and insurers would also be expected to embed a cost associated with the risk of high inflation environments. The use of a non-indexed discount rate in this case would incorrectly assign no value to the indexation feature. Consider for example a plan with indexation based on the CPI increase less 2%, with a minimum of 0%. At December 31, 2013, the offset is in excess of the best estimate of future inflation of 1.88%. In this example, it would not be appropriate to estimate the cost of purchasing this annuity as if it were non-indexed.

6. ACTUAL ANNUITY PRICING

The purpose of this educational note is to provide actuaries with guidance related to establishing assumptions for hypothetical wind-up and solvency valuations. The pricing for an actual group annuity purchase depends on many factors, with the result that the actual price may differ from the guidance provided herein. In addition to the duration of the purchase, some of the factors that may affect pricing of a particular purchase include, but are not limited to:

- The overall size of the purchase;
- The proportion of deferred vested members included in the group being purchased;
- The average pension amount for the pensions being purchased;
- The mortality experience anticipated by the insurance companies bidding on the purchase;
- Broad capital market conditions at the time of the purchase; and
- Competitive pressures in the group annuity market at the time of the purchase. The actuary would consider adjustments to the estimated cost of purchasing an annuity to reflect the expected mortality of the group as described in Section 10. The actuary may make adjustments for the other factors listed above with appropriate justification.

7. INDIVIDUAL ANNUITY PRICING

The PPFRC observes that the pricing of individual and group annuities can differ for reasons such as:

- There is a greater risk of anti-selection for individual annuities;
- The size of the average monthly pension is usually larger for individual annuities;
- Individual annuities may have less complex ancillary features;
- The ability to find appropriate fixed income investments to back the annuity obligation may be a lesser issue for individual annuities due to the relatively small premium size, particularly during a period in which many fixed income instruments are highly illiquid; and
- The group annuity pricing is underwritten at the time of the quote, while individual annuity pricing for a particular quote may be “automated”.

Where an actuary considers that a plan's hypothetical wind-up or solvency liabilities would be settled by the purchase of individual annuities, yields based on relevant individual annuity quotes may be reflected in establishing an appropriate assumption for determining the individual annuity purchase price.

8. LARGE PLANS

Due to capacity constraints within the Canadian group annuity market, pension plans with very large liabilities may have difficulty purchasing a single group annuity to settle their immediate and deferred pension liabilities in the event of a plan wind-up.

Groups with non-indexed annuity liabilities exceeding approximately $500 million may have difficulty in effecting a single annuity purchase to settle their liabilities. Capacity constraints to purchase annuities that are partially or fully indexed to the CPI are significantly more acute. Groups with indexed annuity liabilities exceeding approximately $200 million may have difficulty in settling their liabilities through a single annuity purchase.

It is difficult to predict how the benefits of members who are entitled to an immediate or deferred pension would be settled in the event of an actual wind-up for plans with liabilities significantly above the thresholds noted above.

Paragraph 3240.05.1 of the Standards of Practice states *"For a hypothetical wind-up valuation, the actuary may assume that benefits would be settled by the purchase of annuities regardless of any limitation of capacity in the market for group annuity contracts."*

Thus, in performing a hypothetical wind-up or solvency valuation of such a plan the actuary may assume that the benefits would be settled through a single annuity purchase, even if such a purchase would not be practical. Alternatively, the actuary may make a reasonable hypothesis for the manner in which the benefits may be settled, which would be consistent with the postulated wind-up scenario. Actuaries may refer to the educational note Alternative Settlement Methods for Hypothetical Wind-Up and Solvency Valuations for further guidance.

9. MORTALITY BASIS

The PPFRC does not have access to the mortality assumptions used by insurers for purposes of pricing group annuities. The mortality table and assumed future improvements used to calculate the discount rates underlying annuity purchases are the UP94 generational mortality tables in conjunction with the AA improvement scale, irrespective of the basis used by insurers when submitting quotes. The Final Report on Canadian Pensioner Mortality issued February 13, 2014 indicates that observed pension plan member mortality experience and expected future improvements in mortality rates will result in greater longevity in comparison to this table and improvement scale. However, the UP94 generational mortality table in conjunction with the AA improvement scale has continued to be used in this guidance in order to provide a common basis with the required mortality table for determining benefits assumed to be settled by a lump sum transfer in accordance with section 3500 of the Standards of Practice. The choice of the mortality assumption used for this guidance is unlikely to materially affect the estimated

cost of purchasing an annuity, since the guidance is derived by solving for the discount rate that along with the selected mortality table, produces the price of an annuity.

Paragraph 1720.01 of the Standards of Practice states:

> "*The assumptions that the actuary selects or for which the actuary takes responsibility, other than alternative assumptions selected for the purpose of sensitivity testing, should be appropriate in the aggregate. These assumptions should also be independently reasonable unless the selection of assumptions that are not independently reasonable can be justified.*"

A relevant explanation and example are provided in paragraph 1720.04, which states:

> *"If the use of assumptions that are not independently reasonable could be justified, inappropriateness in a particular assumption could be offset by the inappropriateness in another, for example if one is conservative and the other is not conservative, then they may be appropriate in the aggregate. For example, in a pension plan valuation, group annuity purchase costs may be calculated using mortality and interest rates that would be different from the rates used by an insurance company to price the annuity, but may still provide a reasonable cost for the annuity."*

10. MORTALITY ADJUSTMENTS

The mortality experience of pensioners can be a factor in developing an appropriate basis. The determinant is whether future pensioner mortality would be expected to be materially higher or lower than average either due to credible and persistent experience or due to occupational or demographic factors.

There is evidence that insurers may consider demonstrable substandard mortality experience submitted when establishing the pricing basis for specific group annuities. Insurers also increasingly appear to be considering occupational and demographic factors (including pension size data) in establishing mortality assumptions for specific group annuities.

The actuary would consider an adjustment to regular annuity purchase assumptions where there is demonstrated substandard or super-standard mortality or where an insurer might be expected to assume significantly shorter or longer than average pension plan longevity based on occupational or demographic factors. In such cases, the actuary would be expected to make provisions for future improvements in mortality in a manner consistent with the mortality improvements inherent in the assumed annuity purchase basis.

11. WIND-UP EXPENSES

Unless the actuary is satisfied that the expenses of wind-up are not to be charged to the pension fund, the actuary would make an assumption regarding these expenses and the assumption would be explicit. Expenses normally include such items as fees related to preparation of the actuarial wind-up report, fees imposed by a pension supervisory authority, legal fees, costs related to the purchase of annuities, and administrative costs related to the settlement of benefits. Actuaries may refer to the educational note Expenses in Funding Valuations for Pension Plans for further guidance.

12. RETROACTIVE APPLICATION

If an actuary has already prepared a funding valuation report with an effective date on or after December 31, 2013, before the publication of this guidance, the actuary would consider paragraphs 1820.30 through 1820.36 of the Standards of Practice to determine whether it is necessary to withdraw or amend the report.

13. FUTURE GUIDANCE

The PPFRC intends to continue monitoring group annuity pricing on a quarterly basis. Actuaries may use the spreads indicated above for valuations with effective dates on and after December 31, 2013, up to December 30, 2014, pending any further guidance or other evidence of a change in annuity pricing.

Given the volatility in group annuity pricing that has occurred in the past few years, it is possible that revised guidance may be necessary during the year and, if that occurs, there will necessarily be some delay (such as 30 to 60 days) between the effective date of data collection and the publication of such revised guidance. When reporting results of a valuation within a period prior to 60 days of the effective date of the valuation, the actuary may wish to alert users of the report to the possibility that revisions to the report may be needed if new guidance is published.

Moreover, actuaries would consider the volatility in group annuity prices and pricing factors when communicating advice related to future hypothetical wind-up and solvency valuations.

The PPFRC is continuing to review several aspects of group annuity purchase pricing that may result in revisions to future guidance. In particular, the underlying basis used to express the non-indexed annuity guidance is being reviewed. Currently, the non-indexed annuity guidance is expressed as a spread over yields on Government of Canada long-term bonds in conjunction with the UP94 generational mortality tables (with the AA improvement scale), irrespective of the basis used by insurers when submitting quotes. The PPFRC is exploring whether other bases may be more appropriate to provide more stability in the resulting spread. Following the publication of the Report on Canadian Pensioner Mortality, the PPFRC anticipates that mortality tables will be revised in conjunction with any changes to the mortality basis promulgated under the Standards of Practice for purposes of determining commuted values.

Responsibility for the manner of application of pension-specific standards in specific circumstances remains that of the member in the pension practice area.