RET DAC Model Solutions
Fall 2017

1. **Learning Objectives:**

8. The candidate will be able to recommend and advise on the financial effects of funding policy and accounting standards in line with the sponsor's goals, given constraints.

Learning Outcomes:

(8c) Demonstrate how the retirement plan's cash inflows and outflows can affect the plan sponsor.

(8d) Advise retirement plan sponsors on funding costs including tax deductibility, required contributions and other alternatives to meet the sponsor's goals, consistent with government regulation.

(8e) Advise plan sponsors on accounting costs and disclosures for their retirement plans.

Sources:

Pension RIsk Transfer_Evaluating Impact and Barriers for De Risking Strategies (pages 16, 17, 20 – 27)

DA-170-17: Towers Watson Accounting for Buy-ins (2014)

DA-816-17: Accounting for Pension Buy-In Arrangements (US only; not on CA syllabus)

Commentary on Question:

Commentary listed underneath question component.

Solution:

(a) Describe the features of an annuity buy-in.

Commentary on Question:

No points were awarded for describing the accounting impact of an annuity buy-in.

1. Continued

- An annuity buy-in is a way to mitigate the plan's volatility and risks without actually transferring assets or liabilities out of the plan
- A group annuity contract is purchased and held as an asset within the plan's assets.
- Benefit obligation is not transferred to the insurer but eliminates mortality and interest rate risk
- Annuity contract makes monthly benefit payments to the pension trust and the pension trust then makes benefit payments to the annuitants
- An annuity buy-in generally contains a surrender provision under which it can be terminated
- It could have a significant termination penalty
- It may allow holder to convert to a buy-out annuity upon request and for no additional cost

(b) Compare and contrast annuity buy-ins and annuity buy-outs

Commentary on Question:
Most candidates did well on part (b).

Similarities:

- Both annuity buy-in and buy-out are types of de-risking strategies for pension plans that eliminate interest rate risk and mortality risks.
- Both are priced similarly; will be a premium to purchase because of the risk transfer

Differences:

Topic	**Buy-in**	**Buy-out**
Accounting	• A buy-in does not trigger settlement accounting because the definition of settlement under IAS19/ASC715 would appear to exclude buy-in policies (Under ASC 715 the contract is not irrevocable) • If a buy-in contract is converted to a buy-out contract at a later date, the conversion would be treated as a settlement • If premium paid is greater than the value of the covered obligation under accounting basis, the resulting asset loss will flow through OCI (would be an asset gain if premium < obligation)	• A buy-out does trigger settlement accounting and there are typically losses to recognize • Remove pension obligation and related plan assets from the balance sheet

1. Continued

Benefit payments	• Obligation to make benefit payments remains with the sponsoring company • Employer remains involved and retains ultimate responsibility for payment of benefits if insurer goes bankrupt or cannot pay	• Made by the insurance company directly to annuitants • Participants are notified that responsibility for payment of their benefits has been transferred to the insurer and the employer is no longer involved
Assets and Obligation	US EXAM: • Buy-in should be accounted for as a plan asset and measured at “fair value”, i.e., the surrender value or possibly the premium that would be paid currently. • The relevant PBO may be unchanged or valued on the same basis as the policy value. CA EXAM: • DBO should be valued in a manner consistent with the DBO not covered by the buy-in (ie, no impact on the DBO) • Value of the buy-in policy as an asset should be the value of the DBO it covers (i.e., assets reduced to reflect the value of the underlying DBO)	• Assets are transferred to the insurance company to pay for the annuity buy-outs • Obligation is transferred to the insurance company, reduces pension obligation of plan sponsor
Administration	• Still requires plan administration and related administration fees and insurance premiums	• No further administration required unlike buy-ins • Plan no longer has to pay admin fees or insurance premiums unlike buy-ins
Revocability	• Buy-ins are revocable and generally contains a surrender provision	• Buy-outs are irrevocable and do not contain a surrender provision like buy-ins

2. **Learning Objectives:**

5. The candidate will be able to evaluate sponsor's goals for the retirement plan, evaluate alternative plan types and features, and recommend a plan design appropriate for the sponsor's goals.

Learning Outcomes:

(5l) Give examples of plans that are appropriate for multinational companies and their employees including third country nationals and expatriates.

Sources:

DA-130-13: International (Offshore) Pension Plans – A Growing Trend

Commentary on Question:

Commentary listed underneath question component.

Solution:

(a) Describe the reasons why a company may implement an International Pension Plan.

Commentary on Question:
Candidates had to describe at least 6 reasons why a company would sponsor an international pension plan to receive full points.

- Increasing number of expats or globally mobile workforce: When employees become increasingly mobile and work in various jurisdictions, it may result in fragmented retirement benefits or they may not be eligible to participate in domestic or local plans. An IPP is a flexible vehicle that enables employees to accrue a retirement or long-term savings benefit.

- Competition: Employees who are globally mobile are often high performers who expect competitive benefits including retirement benefits. A company may offer an IPP to attract/retain these employees.

- Lack of home/host country provisions: Expats may be sent to a country where there is no domestic plan in place or they are not eligible for the program. Employees may be reluctant to be displaced to these locations unless there is a competitive offer in place including a retirement program.

- Top-Up provision: An IPP can facilitate the provision of supplementary benefits for key expats/employees. This can be applied to loss of social security benefits because of mobility or replacement of other company benefits.

2. Continued

- Response to legislation: Some IPPs were introduced because of changes in legislation. Example includes the introduction of the IORP Directive in Europe which saw the removal of some employees from the host country plan placed into IPPs.

- Global Management Companies: Some companies are structured as a global employment company which issues employment contracts to deal specifically with expats and special employees. Employees of these companies may necessitate IPPs.

(b) Describe the considerations when evaluating whether to fund an International Pension Plan.

Commentary on Question:
Most candidates were able to identify and describe tax considerations and enhancing benefit security. Successful candidates also identified and described cost allocation to multiple international locations and the time horizon to be used for funding costs.

- Tax considerations: Companies should consider the tax treatment of contributions made to the pension plan. In some circumstances there may be no benefit in kind tax levied on employees for an unfunded plan and, therefore, no tax liability for the employee until the benefit is paid out. If no tax levied for an unfunded plan, the tax position will depend on the participant's place of residence.

- Cost allocation: Allocating costs back to multiple locations and operations can be difficult, as any need for additional cash funding can take place when an expat has relocated several times.

- Time horizon: It is often more desirable to accrue the costs over the working or eligible working lifetime of the employee.

- Benefit sufficiency/security: With a funded plan, it is less problematic to meet benefit obligations for early termination/retirements.

3. Learning Objectives:

1. The candidate will be able to analyze different types of registered/qualified retirement plans and retiree health plans.

2. The candidate will understand the impact of the regulatory environment on plan design.

3. Candidate will be able to analyze the risks faced by retirees and the participants of retirement plans and retiree health plans.

4. The candidate will be able to evaluate plan design risks faced by sponsors of retirement plans and retiree health plans.

8. The candidate will be able to recommend and advise on the financial effects of funding policy and accounting standards in line with the sponsor's goals, given constraints.

Learning Outcomes:

Describe the structure of the following plans:

- (a) Traditional defined benefit plans
- (b) Defined contribution and savings plans
- (c) Hybrid Plans
- (d) Retiree Health plans
- (e) Other alternative retirement plans

Given a plan type, explain the relevance, risks and range of plan features including the following:

- (a) Plan eligibility requirements
- (b) Benefit eligibility requirements, accrual, vesting
- (c) Benefit/contribution formula, including the methods of integration with government-provided benefits
- (d) Payment options and associated adjustments to the amount of benefit
- (e) Ancillary benefits
- (f) Benefit subsidies and their value, vest or non-vested
- (g) Participant investment options
- (h) Required and optional employee contributions
- (i) Phased retirement and DROP plans

(2e) Understand conflicts between regulation and design objectives and recommend alternatives.

(3a) Identify risks face by retirees and the elderly.

3. Continued

(3b) Describe and contrast the risks face by participants of:
- (i) Government sponsored retirement plans
- (ii) Single employer sponsored retirement plans
- (iii) Multiemployer retirement plans, and
- (iv) Social insurance plans

(4a) Identify how plan features, temporary or permanent, can adversely affect the plans sponsor.

(8f) Demonstrate the sensitivity of financial measures to given changes in plan design.

Sources:
Morneau Shepell Handbook of Canadian Pension and Benefit Plans, 15th Edition Chapter 1 (US only p 1-6)

DA-112-13: Converting Pension Plans From a DB to DC design – Issues to Consider in Canada (US p 1-6 only, all for CA)

DA-604-13: Canadian Pension Plan Design (CA only)

DA-166-17: Shifting Public Sector DB Plans to DC, pages 1-22

DA-611-13: Introduction (A58), IFRS1, paragraphs 1-40, Appendix A, Appendix D, D10 and D11 only, IAS19, IFRIC14

DA-813-16: Freezing Defined Benefit Plans (US only)

Commentary on Question:
Commentary listed underneath question component.

Solution:
(a) Describe the advantages and disadvantages of this plan conversion from the following perspectives:

- (i) employer
- (ii) employee

Commentary on Question:
Most candidates did well on part (a).

3. Continued

Employer Perspective
Advantages:

- Greater cost certainty on a go forward basis
- Removes the potential volatile DB costs due to fluctuations in interest rates (although volatility still exists for inactive members)
- Removes investment risk from the employer
- Potentially simpler financial disclosure going forward (no active service cost)
- All employees have the same benefit on a go forward basis
- Plan design fits a more mobile workforce
- No possibility of unfunded liability for future service (still would have an accrued liability for inactive members)
- Removes mortality (longevity risk) from employer

Disadvantages:

- Short term accounting implications (settlement, curtailment, enhanced conversion value)
- DC balance for past accruals may be high if in a low interest rate environment
- Some provinces do not allow a forced conversion value (Canada only)
- Some provinces require employer to fully fund any deficit for members who convert from DB to DC (Canada only)
- May not fully eliminate DB entitlement as deferred vested and retired members still have DB benefits
- Required to file an actuarial report on conversion (Canada only)
- Fiduciary obligation to ensure employees understand DC plan and DB to DC conversion choices and their implications
- Employees in DC plan tend to retire based on business cycles (i.e., more retire when economy is robust), which may not be ideal timing for employers
- Can no longer use DB plan as a tool to retain employees

Employee Perspective
Advantages:

- ER may provide an enhanced DC value if past benefits are converted therefore providing the employee with a greater benefit
- Employees have greater flexibility on how their funds are invested
- Employees have more flexibility with benefit options at retirement
- Benefit value may be more equitable for younger employees under a DC plan than under a DB plan, due to the higher value for a year of accrued service for older employees under a DB plan
- Under a DC plan, members receive the full value of their benefit (i.e., their account balance) regardless of whether they terminate prior to retirement, but may not receive the full value of their benefits (i.e., no ancillary benefits) if they terminate prior to retirement under a DB plan (Canada only)

3. Continued

Disadvantages:

- DC plan may not provide same level of benefit as DB plan going forward
- Employees now assume investment risk
- Potential lower long term rates of return as an individual employee may not be take on as much investment risk as an employer as they are less able to take on risk
- Employees may not have financial knowledge to manage own investments
- If communication is not good from employer, may misinterpret employer plan objectives or make misinformed choices regarding DB to DC conversions
- May not provide enough income at retirement
- Need to plan for uncertainty and volatility of individual vs. group longevity
- Volatile annuity purchase costs at retirement
- Ancillary benefits cannot be provided with DC plans

(b) Describe in words the accounting impact for all three options NOC is considering.

No calculations required.

Commentary on Question:
Successful candidates indicated that converting all the accrued DB benefit into a DC account is a curtailment and that settlement occurs with the plan changes.

1. **Converting Salaried Pension Plan accrued benefit into a DC account balance and having all future benefits accrued under the DC plan**
    - Curtailment accounting required for adjustment to future service ; require immediate recognition of a proportionate share of any past service cost and net transition obligation (not required under IFRS) and immediate recognition of any decrease in plan’s benefit obligation
    - Settlement accounting required for adjustment to past service ; require immediate recognition of a proportionate share of any net transition asset and net gain/loss after settlement (not required under IFRS) and immediate recognition of any increase/decrease in plan’s benefit obligation
    - If enhanced conversion values are provided, may require immediate recognition of additional cost associated with enhanced conversion value
    - DC accounting used for all active employees` service cost (service cost equal to DC contribution)

3. **Continued**

2. **Freeze existing Salaried Pension Plan accruals and all future benefits accrue under the DC plan**
   - Curtailment accounting required for adjustment to future service ; require immediate recognition of a proportionate share of any past service cost and net transition obligation (not required under IFRS) and immediate recognition of any decrease in plan's benefit obligation
   - DC accounting used for all active employees` service cost (service cost equal to DC contribution)

3. **Keep the existing employees in the Salaried Pension Plan and provide the DC plan to new hires only**
   - No adjustment for current members.
   - DC accounting used for new active employees` service cost (service cost equal to DC contribution)

(c) Calculate the DC contribution rate that would provide the same value for a typical career employee at retirement as the current Salaried Pension Plan.

Show all work.

Commentary on Question:
Most candidates calculated the DC contribution rate. Successful candidates applied the ERF and verified the maximum benefit.

DB Pension at Retirement
FAE at retirement:
= $45,000 *((1+3%)^29 + (1+3%)^28 + (1+3%)^27 + (1+3%)^26 + (1+3%)^25))/5
= $100,045.36

Pension at retirement
= 2% * FAE * Service * ERF
= 2% * $100,045.36 * 30 * (1 - 3%*(62 – 60))
= $56,425.59

Check that accrued pension doesn't exceed maximum pension
= $3,000 * 30
= $90,000

Therefore pension at retirement is $56,425.59

Value of DB Plan at retirement
= $56,425.59 * 11.5
= $648,894

3. **Continued**

Projected DC account balance at retirement
Let X = Contribution Rate
= $45,000 *X * (1.03)^0 * (1.065)^29 + $45,000 * X * (1.03)^1 * (1.065) ^ 28 + …
+ $45,000 * X * (1.03)^28 * (1.065)^1 + $45,000 * X * (1.03)^29 * (1.065)^0
= $45,000 * 1.065^29 * (1 – (1.03/1.065)^30/(1-1.03/1.065))
= $5,383,419 * X

Solve for Contribution Rates
$5,383,419 * X = $648,894
X = 12.05%

Alternatively, could equate lifetime pensions and solve for contribution rates
Lifetime pension from projected DC account balance
= $5,383,419 * X / 11.5
= $468,123.39 * X

$468,123.39 * X = $56,425.59
X = $12.05%

If the DC contributions rates were assumed to be made middle of the year, the DC projected balance is $5,555,626 and the DC contribution rate is 11.68%.

4. Learning Objectives:

1. The candidate will be able to analyze different types of registered/qualified retirement plans and retiree health plans.

3. Candidate will understand how to analyze the risks faced by retirees and the participants of retirement plans and retiree health plans.

Learning Outcomes:

Describe the structure of the following plans:

- (a) Traditional defined benefit plans
- (b) Defined contribution and savings plans
- (c) Hybrid plans
- (d) Retiree Health plans
- (e) Other alternative retirement plans

Given a plan type, explain the relevance, risks and range of plan features including the following:

- (a) Plan eligibility requirements
- (b) Benefit eligibility requirements, accrual, vesting
- (c) Benefit/contribution formula, including the methods of integration with government-provided benefits
- (d) Payment options and associated adjustments to the amount of benefit
- (e) Ancillary benefits
- (f) Benefit subsidies and their value, vest or non-vested
- (g) Participant investment options
- (h) Required and optional employee contributions
- (i) Phased retirement and DROP plans

(3b) Describe and contrast the risks face by participants of:

- (i) Government sponsored retirement plans
- (ii) Single employer sponsored retirement plans
- (iii) Multiemployer retirement plans, and
- (iv) Social insurance plans

(3c) Evaluate benefit adequacy and measure replacement income for members of a particular plan given other sources of retirement income.

Sources:

DA-110-13 Integration with Social Security,

DA-123-13 Replacement Ratio Study

Commentary on Question:

This question tested candidates' ability to identify the challenges of pension plan integration with social security benefits.

4. Continued

Solution:

(a) Describe the challenges in achieving full integration of an employer provided retirement plan with a defined benefit social security program.

- integrating a plan formula directly or indirectly is unlikely to achieve full integration since that is only one element of the plan provisions
- social security benefit may not take years of service into account in their formula
- social security benefit does not take into account how many years of service with a particular employer
- the plan benefit usually takes into account only service while at the company
- social security usually counts total compensation over a working lifetime
- a private plan may not take into account overtime or bonus compensation
- an employer may choose not to limit earnings
- a regulatory limit of covered earnings may not be related to the social security max
- there may be a plan mismatch
- one of the plan's might be DC and the other plan DB
- there may be regulatory limits on private plan integration
- early retirement dates may be different
- normal retirement dates may be different
- a private plan may offer a bridge benefit which may not be aligned with social security
- different methods of integration may be more accurate than others e.g. some may only approximate social security, some may only offset a portion of social security
- a member might retire from the different plans at different times which impacts integration regardless of provisions matching
- Other considerations:
  - Determination of covered earnings may be different e.g. use of career vs final average earnings, different averaging periods can be used
  - Early retirement subsidies may be different

Consideration for cost of living adjustments

(b) Explain why Company XYZ's plan design is not equitable for all lifetime employees.

Justify your response, including examples using replacement ratios.

Show all work.

4. Continued

Commentary on Question:
Candidate received full points if they calculated at least 2 replacement ratios and used them to justify their response.

Word explanation:
- an employee with earnings under the covered limit may have a higher replacement ratio because they receive a government benefit which bumps up their retirement income
- an employee with earnings over the covered limit may have a lower replacement ratio because they do not receive a government benefit
- replacement ratios will not be the same for all employees due to the staggered benefit formula
- social security is not perfectly integrated in the plan design because of its cliff nature

Mathematical explanation:

Need to provide an example of replacement ratio for employee earning under the covered limit:

- replacement ratio = total pension benefit / pre retirement earnings
- annual plan benefit = (1.4% * gov limit + (earnings - gov limit) * 2%) * years service
- annual gov benefit = $300 * 12 if earnings are below gov limit
- employee plan benefit = 40000 * 1.4% * 35 = 19600
- gov benefit = 3600
- total pension benefit = 19600 + 3600 = 23200
- replacement ratio = 23200 / 40000 = 58%

Example of replacement ratio for employee earning above the covered limit:
- employee earning over the covered limit: gov benefit = 0
- example of replacement ratio with earnings above covered limit (work shown)
- rep ratio of low earner > rep ratio of high earner (above and below covered limit)

5. **Learning Objectives:**

8. The candidate will be able to recommend and advise on the financial effects of funding policy and accounting standards in line with the sponsor's goals, given constraints.

Learning Outcomes:

(8a) Perform valuations for special purposes, including:
- (i) Plant termination/windup
- (ii) Accounting valuations
- (iii) Open group valuations
- (iv) Plan mergers, acquisitions and spinoffs

(8e) Advise plan sponsors on accounting costs and disclosures for their retirement plans.

Sources:

DA-168-17: IFRS and US GAAP: Similarities and Differences

DA-145-13: Acquiring a U.S. Operation—A Primer

DA-148-13: Mergers and Acquisitions: Due Diligence of Retirement Plans

DA-157-17: PWC IFRS Manual of Accounting (paragraphs11.1 – 11.10 (Intro), 11.53-11.63 (termination benefits),11.63-11.260 (Post- employment benefits)

DA-611-13: Introduction (A58), IFRS1, paragraphs 1-40, Appendix A, Appendix D, D10 and D11 only, IAS19, IFRIC14

DA-169-17: Mergers and Acquisitions: key considerations for retirement plan conversion

Commentary on Question:

Commentary listed underneath question component.

Solution:

(a) Describe the advantages and disadvantages of the following pension arrangements for the acquired division's employees from both companies' perspectives:

(i) Company XYZ retains all past-service pension liability and Company ABC establishes an identical pension plan for all future service.

(ii) Company ABC assumes XYZ's pension plan, including all past service pension liabilities.

5. Continued

Commentary on Question:
Successful candidates provided advantages and disadvantages from the perspectives of Company XYZ and ABC and the acquired division employees (XYZ employees). No points were awarded for responses related to ABC employees. Credit was also awarded for other answers that were reasonably justified.

- Company XYZ retains all past-service pension liability and Company ABC assumes all future-service pension liability
  Advantages:
  - Preferable from Company ABC's point of view.
    - Company ABC assumes no accrued liability
    - Does not require transfer of assets
    - Would not require regulatory approval
  - Preferable from Company XYZ's point of view:
    - May not force Company XYZ to wind up (terminate) it's pension plan

  Disadvantages:
  - Employees may be frustrated about receiving pension benefits from two different sources.
  - Might also have issues if formula based on final or career average as future benefits may be reduced.

- Company ABC assumes all of Company XYZ's pension liability
  Advantages
  - Straightforward transition
  - Resolves Company XYZ's pension liability
  - Employees receive pension from one source

  Disadvantages
  - Company ABC now assumes all liabilities where it did not have a pension liability before.
  - Would need to consider whether plan is overfunded or underfunded and on what basis. Adds complexity to acquisition transaction pricing.

(b) Calculate the revised fiscal year 2017 Defined Benefit Cost by component under international accounting standard IAS 19, Rev 2011 for Company XYZ as a result of the transaction.

Show all work.

5. **Continued**

Commentary on Question:
Successful candidates showed all calculations. Solution below prorates interest cost and assumes that end of year service cost was provided. Full points were also awarded if candidates recalculated interest cost and assumed beginning of year service cost was given.

Current Service Cost (9 months only)
= Service Cost for the year (prior to the Transaction) x 9 / 12
= $8.5M x 9/12
=$6,375,000

Assets as at September 30, 2017
= Assets as at 12.31.2016 x (1 + ROR for the period) +
(Full year expected Contr – benefit payments) x 9/12 x (1 + 0.5 x ROR for the period)
= $120M x (1 + 10%) + (15M – 10M) x 9/12 x (1+ 0.5 x 10%)
=$135,937,500

DBO as at October 1, 2017
= DBO BOY x (1+int for 9 mths) + CSC BOY x (1+ int for 4.5 months) – Benefit payments x (1+ int for 6 months) prorated for 9 months
=$150M x (1+4%*9/12) + $8.5M x 9/12
- $10M x (1+4% /2) x 9/12
= $153,225,500

Service Cost due to curtailment and settlement
=(Gain)/Loss due to the transaction
=$153,225,000 - $135,937,500
=$17,287,500

Service Cost = $6,375,000 +$17,287,500 = $23,662,500

Interest cost
= 900,000 x 9/12
= 675,000

Remeasurement =0

Total Defined Benefit Cost
= Service Cost + Interest cost + Remeasurement
= $23,662,500 + $675,000 = 24,337,500

5. Continued

(c) Calculate the fiscal 2017 Defined Benefit Cost under international accounting standard IAS 19, Rev 2011 for Company ABC, assuming no changes to the assumptions.

Show all work.

Commentary on Question:
Solution below prorates interest cost and assumes that end of year service cost was provided. Full points were also awarded if candidates recalculated interest cost and assumed beginning of year service cost was given.

Current Service Cost for fiscal 2017
= Current Service Cost for 3 months from Oct 1 to Dec 31
= $8.5M x 3/12
= $2,125,000

Interest Cost for fiscal 2017
= Funded status x int for 3 months – contributions for x int for 6 months prorated for 3 months
= $17,287,500 x (4%* 3/12) - $15M x (4%/2) x 3/12
= $97,875

Remeasurement = $0 (no change in discount rate)

Total Defined Benefit Cost for fiscal 2017 = $2,125,000 + $97,875 = $2,222,875

6. Learning Objectives:

3. Candidate will be able to analyze the risks faced by retirees and the participants of retirement plans and retiree health plans.

5. The candidate will be able to evaluate sponsor's goals for the retirement plan, evaluate alternative plan types and features, and recommend a plan design appropriate for the sponsor's goals.

Learning Outcomes:

(3d) Propose ways in which retirement plans and retiree health plans can manage the range of risks faced by plan participants and retirees.

(5c) Assess the feasibility of achieving the sponsor's goals for their retirement plan.

(5f) Design retirement programs that manage retirement risk and are consistent with sponsor objectives.

(5m) Recommend an appropriate plan type and plan design features for providing retirement benefits and defend the recommendations.

Sources:

Managing Post-Retirement Risks, A Guide to Retirement Planning; New Retirement Plan designs for the 21st Century

Commentary on Question:

Commentary listed underneath question component.

Solution:

(a) Describe how the characteristics of the plan design affect the following risks for the plan sponsor and participants:

(i) Inflation risk

(ii) Longevity risk

(iii) Investment risk

Commentary on Question:

For inflation and investment risks, successful candidates identified and supported who bears the risk both pre- and post-retirement. For longevity risk, successful candidates identified the DB portion was paid as an annuity and the DC as a lump sum.

6. Continued

(i) Inflation risk – the risk that inflation will decrease the value of the benefit
   a. Career average benefit (CAB) formula results in the participant bearing all the pre-retirement inflation risk since each annual accrual is not adjusted by inflation. The benefit is then paid as an annuity and does not increase with inflation, which decreases the purchasing power of the retiree.
   b. The inflation risk on the DC portion is borne entirely by the participant since they are responsible for investing their contributions. If the return on investment does not match or exceed inflation, the value of the benefit is reduced. At retirement, the DC portion of the benefit is transferred to the participant as a lump sum. At that time, the participant must try to earn a return greater than inflation. Further, the participant can hedge their risk by investing in inflation adjusted securities.

(ii) Longevity Risk
   a. DB portion of benefit (CAP) is paid as an annuity and the entire risk is borne by the plan sponsor. The sponsor is obligated to pay the benefit as long as the participant is alive.
   b. DC portion of the benefit is paid as a lump sum and the entire risk is borne by the participant. Plan sponsor has no obligation to pay any benefit if assets for a participant runs out.

(iii) Investment Risk
   a. The plan sponsor bears the entire investment risk on the DB portion of the benefit; both pre and post retirement. They are required to earn an investment return sufficient enough to pay all retiree benefits or contribute to make up the shortfall.
   b. The participant bears the entire investment risk for the DC portion. Once the sponsor makes the contribution required by the plan, the participant is responsible for earning returns, both pre- and post-retirement, sufficient enough to provide income for the duration of their lifetime.

(b) Recommend plan design changes that accomplish this goal.

Justify your response.

Commentary on Question:
Successful candidates identified plan features that can be changed or eliminated to reduce the employee's risk and identified who will pay for the risk-reducing feature or indicated the change is cost neutral.

Credit was also awarded for answers not specifically noted below that were reasonably justified.

6. **Continued**

To reduce inflation risk, the plan sponsor could:

- Change from a career average formula to final average pay formula. This would reduce the pre-retirement inflation risk since the final benefit would be based on a pay more similar to retirement (than CAB).
- Offer an annuity with a COLA for the DB portion – the annuity could be converted on an actuarially equivalent basis, thus making it cost neutral to the plan sponsor.
- Additionally, the sponsor could add COLA adjusted annuities from the DC plan. DC benefits would be paid for by the participant making it cost neutral.

To reduce longevity risk, the plan sponsor could:

- Offer annuities in the DC plan. They could be offered at an actuarially equivalent basis, making it cost neutral.
- Change benefits above $50,000 threshold to be variable DB benefits. The benefits would vary by investment return at no cost to the plan sponsor

To reduce investment risk, the plan sponsor could:

- Offer a guaranteed investment option that provides a minimum guaranteed return and is paid for by limiting the upside return. For example, the option could guarantee 3% return and limit the highest return to 10% (or whatever threshold is determined to make the option cost neutral).

7. **Learning Objectives:**

3. Candidate will be able to analyze the risks faced by retirees and the participants of retirement plans and retiree health plans.

4. The candidate will be able to evaluate plan design risks faced by sponsors of retirement plans and retiree health plans.

Learning Outcomes:

(3a) Identify risks face by retirees and the elderly.

(3c) Evaluate benefit adequacy and measure replacement income for members of a particular plan given other sources of retirement income.

(4a) Identify how plan features, temporary or permanent, can adversely affect the plans sponsor.

(4c) Recommend ways to mitigate the risks identified with a particular plan feature

Sources:

DA-152-15: ACPM Target Benefit Plan Paper, March 30,2012
DA-153-15: ACPM Target Benefit Plan Supplemental Paper
Analysis of Target Benefit Plan Design Options (pp. 12-16)
DA-164-17 Defined Contribution Plan Success Factors

Solution:

(a) Describe six plan design features for a defined contribution plan that help participants generate adequate retirement savings during their working career.

1. Immediate eligibility
Allow participants to enroll immediately or soon after employment

2. Automatic enrollment
Auto-enroll employees at an initial deferral percentage designed to achieve the plan's savings and income replacement goals.

3. Automatic contribution escalation
Increase participant contribution rates by 1% to 2% per year, so as to reach an ultimate rate that achieves the plan's goals.

4. Stretch employer match contributions
Consider stretching the match over a larger percentage of compensation to encourage participants to reach for higher levels of savings.
Example, in lieu of a common match of 50% on the first 6% of deferrals, plan sponsors can influence savings rates by changing the employer match to 33% on the first 9% of deferrals.

7. **Continued**

5. Additional matching contributions
Provide an additional matching contribution in addition to the mandatory employer contribution

6. Re-enrollment
Expand the benefits of automatic features by implementing re-enrollment strategies on a periodic basis

7. Discourage early withdrawals and loans from retirement savings

Set limits on outstanding loan times, waiting periods

Encourage terminated pre-retirees to leave balances in the plan or to roll them over to an alternative retirement vehicle.

8. Encourage consolidation of participants' retirement accounts
Helps better manage assets and achieve economies of scale and plan for retirement

9. Provide limited menu of investment options
Enough options to cover basic asset classes, e.g. domestic and foreign, life stage and index funds

10. Generous employer contributions
Helps accumulate higher retirement assets
Ensures at least a floor or savings for the participant

Provide a guaranteed minimum rate of return on assets

Add profit sharing component to boost contributions

(b) Calculate the retirement replacement ratio if the participant contributes 4% of salary.

Show all work.

Commentary on Question:
Candidates were awarded points for other reasonable approaches when accumulating the DC balance.

7. Continued

Project salary to age 64 (not 65): 60,000 x 1.02 ^ 34	
Value	117,641
Accumulate contributions * : 60,000 x 128.97 x (6% + 4%)	
Value	773,820
Accumulate 10,000 opening lump sum deposit: 10,000 x 1.055 ^ 35	
Value	65,138
Total retirement assets	
Value	839,958
Annual income = retirement assets / lump sum conversion factor	
Value	65,289
Replacement ratio = annual income / final salary	
Value	55%

* Accumulation factor of 128.97 was determined using the formula.

$$[\frac{1}{return - salary\ scale}\ x\ \left[1 - \left(\frac{1 + salary\ scale}{1 + return}\right)^n\right] x\ (1 + return)^n$$

$$\frac{1}{0.055-0.02}\ x\ \left[1 - \left(\frac{1+0.02}{1+0.055}\right)^{35}\right] x\ (1 + 0.055)^{35} = 128.97$$

(c) Calculate the employee contribution rate that will result in a retirement replacement ratio of 70%.

Show all work.

Commentary on Question:
Candidates were awarded points for other reasonable approaches.

Replacement ratio from initial deposit: 65,138 / 12.85 / 117,641	4%
Employer and employee replacement ratio is 55% from (b), less 4%	51%
Employer replacement ratio is 6% / 10% of 51%	31%
Current employee contributions of 4% / 10% of 51%	20%
Target RR from employee is 70% - 4% - 31%	35%
Required employee contributions = 35% / 20% x 4%	7%

8. **Learning Objectives:**

3. Candidate will be able to analyze the risks faced by retirees and the participants of retirement plans and retiree health plans.

4. The candidate will be able to evaluate plan design risks faced by sponsors of retirement plans and retiree health plans.

Learning Outcomes:

(3a) Identify risks face by retirees and the elderly.

(3b) Describe and contrast the risks face by participants of:
- (i) Government sponsored retirement plans
- (ii) Single employer sponsored retirement plans
- (iii) Multiemployer retirement plans, and
- (iv) Social insurance plans

(4a) Identify how plan features, temporary or permanent, can adversely affect the plans sponsor.

Sources:

DA-166-17: Shifting Public Sector DB Plans to DC, p 1-22

Commentary on Question:

Commentary listed underneath question component.

Solution:

(a) Identify the objectives of all public sector pension plan stakeholders.

Commentary on Question:
Successful candidates identified objectives rather than characteristics of stakeholders. Candidates needed to identify at least 4 stakeholders and list their objectives to receive full points.

1. Employer and plan sponsor
   - Want low costs and low volatility
   - Uses the plan to attract and retain employees
2. Public employee
   - Want adequate and assured benefit when retire
   - Want low contribution rates when working
3. Current taxpayers
   - Want low taxes
   - Want the services that the public sector workers provide
4. Elected officials
   - Want to become re-elected
   - Would prefer to postpone paying pension contributions to lower taxes

8. **Continued**

5. Unions
   - Want employees to have valuable benefits
   - Desire for low employee contributions and high salary while working
6. Retirement plan governing body
   - Focus on long term health of the plan
   - Desire for plan that is simple to administer

(b) Describe the effect this proposal will have on all public sector pension plan stakeholders identified in part (a).

Commentary on Question:
Successful candidates considered how each feature affects the stakeholders.

Employer and plan sponsor:
- Shifts the investment risk to the employee
- Will reduce the volatility of contributions
- The contributions will no longer be optional which could increase costs
- Lose effective way to manage retirement of workforce

Public employee:
- They now bear all of the investment risk which they may not be educated to handle
- Have more responsibility in planning for their own retirement
- The benefit is portable with aids in job flexibility

Current taxpayers:
- The employer contributions are passed onto taxpayers and are now required which could increase taxes
- Shifting the investment risk to the employees means future taxpayers won't have to make up deficits to the plan
- Public employees may be more dependent on tax-supported welfare if not prepared for retirement

Elected officials:
- Can no longer postpone pension contributions which could lead to budget cuts elsewhere to fund those contributions
- Will still have an unfunded DB plan to maintain and fund

Unions:
- Perceived reduction in benefits which could lead to demands for benefit or salary increases

Retirement plan governing body:
- Still have to administer and maintain historical DB plan
- Added complexity of maintaining two plans

9. Learning Objectives:

7. The candidate will be able to analyze/synthesize the factors that go into selection of actuarial assumptions.

9. The candidate will be able to apply the standards of practice and guides to professional conduct.

Learning Outcomes:

(7a) Evaluate appropriateness of current assumptions.

(7b) Describe and explain the different perspectives on the selection of assumptions.

(7d) Recommend appropriate assumptions for a particular type of valuation and defend the selection.

(9e) Explain and apply all of the applicable standards of practice related to valuing retirement obligations.

Sources:

DA-139-25: ASOP 35 Selection of Demographic and Other Noneconomic Assumptions for Measuring Pension Obligations

DA-146-15: ASOP 6 Measuring Retiree Group Benefit Obligations and Determining Retiree Group Benefits Program Period Costs or Actuarially Determined Contributions

DA-162-16: Selecting and Documenting Mortality Assumptions for Pensions

DA-163-16: Deloitte - Financial Reporting Considerations Related to Pension and Other Postretirement Benefits [CA excludes HC reform p 11 & 12]

Commentary on Question:

Commentary listed underneath question component.

Solution:

(a) Critique the use of the pension plan assumptions for the post-retirement benefits plan.

Commentary on Question:

Many candidates did well on Part (a) and explained different assumptions and reasoning behind them and why they should be used for post-retirement benefits and pension plans.

9. Continued

Termination Assumption

- If the company has high turnover the PRB obligation is being overstated. If a plan member terminates prior to reaching age 55 and 10 years of service then he/she is not entitled to the post-retirement benefits.
- There would be a gain on every termination under age 55.
- There would be a gain on every termination at age 55 and over when the member did not have 10 years of service.
- This could result in gains year after year in the valuation.
- No termination scale may be appropriate for a pension plan where participants are entitled to the accrued pension upon termination (assuming the participant is vested) and/or early retirement reduction factor is actuarially equivalent.

Retirement Assumption

- Some individuals will retire prior to age 65 since they can retire as early as age 55 with 10 years of service. An assumption that all plan members will retire at age 65, will result in a difference of 10 years of possible cash flows and understate the obligation.
- Medicare in US / provincial health care coverage in Canada begins at age 65, which reduces the health care cost for retirees age 65 and older compared to those younger than 65. There would be a higher health care claims cost below age 65 and up to 10 additional years of cash flow, which would increase the post-retirement obligation.
- This could lead to year over year losses in the valuation.
- A single retirement age assumption may be appropriate for the pension valuation if the early retirement reduction is actuarially equivalent, but not for the post-retirement benefits valuation.
- The actuary should select explicit age or service-related retirement rates. A single average retirement age is generally not appropriate for post-retirement health valuations (ASOP 6).

Mortality Assumption

- The plans cover the same group of employees. Therefore, it might be appropriate to use the same mortality assumption for both plans since it represents best estimate assumption without margins.
- Mortality rates that are appropriate for measuring pension obligations are not necessarily appropriate for measuring life insurance.
- Mortality improvements (i.e., a longer life expectancy) would have same impact on both the pension plan and the health care obligation but it would have the opposite effect on life insurance benefit obligation.

9. Continued

- Current assumption of GAM 1994 is outdated. Recent experience studies/papers show that longevity has improved more than expected by Scale AA derived from the previous mortality experience study. The plan sponsor may want to look at a newer table such as RP-2014 in US (for Canada - CPM 2014 - private sector, public sector or blended table).
- The actuary should take into account the sensitivity of liabilities to the mortality assumption when selecting a mortality improvement assumption under ASOP 35.

Discount Rate Assumption:

- The discount rate should be based on the underlying cash flow of each plan. It is likely the postretirement medical and pension plans will have different expected cash flow, different durations and therefore different discount rates. This is due to postretirement medical pre-65 claims being higher than post-65 claims due to social insurance integration. Also, this could be due to annuity vs lump sum availability/assumptions in pension plan.

Salary Scale Assumption

- Medical benefits are not usually tied to salary.
- Life insurance could be flat dollar or tied to a percentage of pay. Assuming life benefits are based on a percentage of pay, it is appropriate to be the same between both plans as the plans cover the same population. This assumes that the same plan compensation definition is used. If the pension plan includes bonuses while the definition under the life insurance plan is base compensation only, the salary scale may differ slightly.

CPI Assumption

- It is appropriate to use the same CPI assumption for both plans, since this assumption is not tied to a specific plan but a general, economic wide assumption.

General comments

- From ASOP 6 - the actuary should take into account the purpose of the measurement and the differences between the characteristics of retiree group benefits obligations and the characteristics of pension benefit obligations. To measure retiree group benefits obligation, more refined demographic assumptions may be required than to measure the pension obligations.

9. Continued

(b) Describe other assumptions that may be necessary for a post-retirement benefits plan valuation.

Commentary on Question:
Successful candidates described health-specific assumptions, rather than just listing them.

- ***Health care expected claims cost*** **–** It is based on employer's underlying plan design copays/coinsurance/deductible. Claims should be age/gender and retiree specific, reflecting any integration with a social insurance plan.
- ***Health care trend rate*** **–** It is used to project out current year claims costs developed to future years. SOA Getzen model can be used to develop long-term increases in health care costs. The plan sponsor might want to consider other economic assumptions (ie, CPI) in PRB valuation when determining inputs.
- ***Election percentage of benefit***. The election of a postretirement benefit is tied to retiree contributions and other postretirement benefits available. For life insurance, retiree contributions are usually zero and therefore most likely 100% will have life insurance coverage at retirement. For medical benefits, the higher the contribution, the less likely the benefit will be elected. Other barometers for health care election percentages are what the current active health care election rate is and availability of other postretirement medical benefits (for ex. electing spouse's plan if better). When setting election percentage assumption, past experience and future expectations should be taken into account.
- ***Spousal election and surviving spouse election*** **–** medical benefits may be offered at different contributions to a retiree's spouse or surviving spouse. The election rate of a dependent coverage should be determined. Barometers can be a percentage of married and a percentage elected under current plan. Past experience and future expectations should be taken into account.
- ***Retiree contribution increase assumption*** **–** Retiree contributions are generally defined as a dollar amount or a percentage of the plan's premium. Future increases in retiree contributions should be based upon the plan provisions. If contributions are tied to a percentage of premium, then the increase in contribution is generally equal to the health care trend rate.
- Any ***caps*** included in the plan provisions should be reflected in the projection of claims and contributions.

10. **Learning Objectives:**

4. The candidate will be able to evaluate plan design risks faced by sponsors of retirement plans and retiree health plans.

7. The candidate will be able to analyze/synthesize the factors that go into selection of actuarial assumptions.

Learning Outcomes:

(4a) Identify how plan features, temporary or permanent, can adversely affect the plans sponsor.

(4b) Assess the risk from options offered, including:
- (i) Phased retirement
- (ii) Postponed retirement
- (iii) Early Retirement
- (iv) Option factors
- (v) Embedded options
- (vi) Portability options

(7a) Evaluate appropriateness of current assumptions.

(7d) Recommend appropriate assumptions for a particular type of valuation and defend the selection.

Sources:

DA-101-13: Legal and Research Summary Sheet: Phased Retirement

DA-100-13: Issues for Implementing Phased Retirement in Defined Benefit Plans

DA-140-15: ASOP 27 Selection of Economic Assumptions for Measuring Pension Obligations

DA-139-15: ASOP 35, Selection of Demographic and Other Noneconomic Assumptions for Measuring Pension Obligations

DA-136-17: Selection of Actuarial Assumptions, Consultant Resource Manual, SOA Version, Mercer

Commentary on Question:

Commentary listed underneath question component.

10. Continued

Solution:

(a) Describe the advantages and disadvantages of both options from the perspective of:

(i) Company ABC

(ii) the member

Option A: Allow members to start commence partial pension payments while continuing to work on a part-time basis

ABC Company advantages:
- Employer retains talent and experience and may mitigate labor shortage.
- Employer postpones search for and training of new employees
- This arrangement gives the employer an opportunity to extend the labor force participation of their older workers

Member advantages:
- Employee reduces schedule but replaces lost earnings with partial retirement distribution.
- Employee may continue to participate in employer sponsored employee benefit plans, depending on the amount of the reduction of schedule.

Disadvantages for ABC Company:
- Calculating the final full retirement benefit would be more complicated for defined benefit plans.
- Employers may be exposed to potential lawsuits that result from a formal phased retirement program.
- Additional pension plan administrative burden and/or additional HR burden may result from a formal phased retirement program.

Disadvantages for Member:
- Employee may lose eligibility for employer-sponsored health care and other employee benefit plans, depending on the amount of the reduction of hours
- Employer sponsored life and disability insurance based on compensation would be reduced
- Reduction in hours could result in reduction in final pension benefits for final average pay plans
- Reduction in hours could result in loss of benefit accruals in a defined benefit plan or eligibility for employer contributions in a profit sharing plan.
- Spousal survivor benefits may be reduced upon full retirement.

10. Continued

Option B: Allow members to commence full pension payments and continue working on a full-time basis

ABC Company advantages:

- Employer retains talent and experience and may mitigate labor shortage.
- Employer postpones search for and training of new employees
- This arrangement gives the employer an opportunity to extend the labor force participation of their older workers

Member advantages:

- Employee is eligible for all employee benefits available to other full-time employees

Disadvantages for ABC Company:

- Employers may be exposed to potential lawsuits that result from a formal phased retirement program
- Additional pension plan administrative burden and/or additional HR burden may result from a formal phased retirement program

Disadvantages for Member:

- Less flexible arrangement.
- Pension benefits may be suspended while working full-time.

(b) Describe how Company ABC's assumptions under international accounting standard IAS No. 19, Rev. 2011 may be affected if Company ABC implements a phased retirement program.

Inflation

- No impact. The Inflation assumptions is not based on plan specific characteristics. Inflation is based on CPI, forecasts of inflation, and yields on government securities. None of these items are impacted by a phased retirement program

Investment Return

- The investment return assumption is based on the plan's asset allocation and the expected return of each asset class. It may be affected by phased retirement if ABC Company changes its asset allocation to better match the plan's cash flows following the phased retirement program

Discount Rate

- Discount rate is based on the plan's cash flows. It may be affected if ABC Company's cash flows are materially different after implementing phased retirement

10. **Continued**

Compensation increase assumption

- Depending on ABC Company's definition of final average earnings during phased retirement, the compensation increase assumption for phased retirees may be impacted.
- A different salary scale for regular full-time employees vs. those in the phased retirement program may be appropriate if they receive different levels of pay increases and bonuses

Mortality

- If plan is large enough to have credible experience, it is possible mortality could decrease under a phased retirement program as less healthy employees may see a benefit to their health of working only part-time under a phased retirement program
- For smaller plans using industry tables the phased retirement program will likely not change the mortality assumption

Termination

- Since this assumption typically ends at early retirement, it is unlikely this assumption is affected by a phased retirement program that begins at early retirement age

Retirement

- Will need to review assumption after the phased retirement program is successfully implemented. Phased retirement will affect the retirement assumptions

Percent married and spousal age difference

- Unaffected by a phased retirement program

11. **Learning Objectives:**

6. The candidate will be able to analyze, synthesize and evaluate plans designed for executives or the highly paid.

Learning Outcomes:

(6a) Given a specific context, synthesize, evaluate and apply principles and features of executive deferred compensation retirement plans.

(6b) Given a specific context, apply principles and features of supplemental retirement plans.

Sources:

DA-135-13 Towers Perrin, The Handbook of Executive Benefits, Chapter 15 (Golden Parachutes pp238-244

Retirement Plans – 401(k), IRAs and Other Deferred Compensation Approaches, Allen, 11th Edition, Chapter 14 (US all of ch 14; CA pp 250-263 only)

Some relevance to DA-156-15: Moving from a DB Executive Retirement Plan to a DC Executive Retirement Plan, Aon Hewitt, October 2014 (US Part 1, 2 and 4; CA Part 4 only)

Commentary on Question:

Commentary listed underneath question component.

Solution:

(a) Compare and contrast the options from the perspective of:

(i) Company ABC

(ii) the executive

Commentary on Question:

Successful candidates compared and contrasted the options, as opposed to listing pros and cons.

Option 1 – Base salary of $750,000 with 50% target annual bonus paid in each year

Executive Perspective:

No vesting rules means no retention requirements

Incentive to perform well

More guaranteed cash received in first few years not dependent on staying with ABC

11. **Continued**

Compensation is taxed at current tax bracket, which may be different at retirement.
Executive may have to save for retirement, as there is no retirement benefit.

ABC Perspective:
Additional cash in first few years may put a strain on cash flow.
The compensation cannot retain the executive, as there are no vesting rules
The bonus may provide incentive for the executive to perform well
No pension accounting requirements

Option 2 – Base salary of $600,000 with 40% target annual bonus paid in each year plus

- $250,000 in restricted company stock in each year
- the restricted company stock vests after 3 years

Executive Perspective:
Compensation is taxed at current tax bracket, which may be different at retirement.
Executive may have to save for retirement, as there is no retirement benefit.
Overall compensation may decrease if stock and/or company does not perform well
Incentive to perform well

ABC Perspective:
Can be used to motivate the executive, as it ties her compensation to company performance
Bonus still large and may provide incentive for the executive to perform well
Vesting restrictions on stock are a form of retention
No pension accounting requirements
Annual accounting required for restricted stock

Option 3 – Base salary of $500,000 with 0% target annual bonus paid in each year plus

- a total supplemental retirement benefit of $3,000,000, payable in 5 equal annual installments
- the benefit does not vest until retirement
- the benefit is not funded

Executive Perspective:
Compensation taxed during retirement may be different than current tax bracket.
Retirement benefit is not secure, since have to work 5 years to get it
Unfunded retirement benefit for 5 years starting at retirement exposes executive to funding risk over a long-term horizon.

11. Continued

Lower cash in first 5 years, offset by higher pension amount paid over 5 years.
No need to save for retirement if stay for 5 years

ABC Perspective:
Golden handcuffs, since nothing other than base salary payable until retirement
Significant cash outlay over a 5-year period starting at retirement
Need to record an accounting expense each year
No linkage to executive performance (no bonus)
No linkage to company performance (no stock compensation)
Extends relationship with executive for 5 years beyond employment period

(b) Describe the benefits of including golden parachute provisions in an executive employment contract.

Commentary on Question:
Most candidates did well on part (b).

Golden parachutes help attract and retain senior executives
Golden parachutes provide a form of financial protection for executives
In the event of change in control, golden parachutes may allow executives to remain focused during the transaction process
In the event of change in control, golden parachutes may lessen the likelihood of the executive seeking employment elsewhere and help retain the executive
In the event of change in control, golden parachutes may incent the executive to act in the best interests of shareholders
In the event of change in control, golden parachutes may allow the executive to focus on the merits of the change in control with some degree of detachment

(c) Recommend four golden parachute provisions the executive should request during contract negotiations.

Justify your response.

No calculations required.

Commentary on Question:
Successful candidates identified that executives should be protecting their rights after sale of company.

11. **Continued**

The executive should request a provision to address how her SERP/Deferred compensation will be handled/funded in the event of change in control. Examples can include:

- Paying out the SERP upon change in control
- Providing for secure financing of the SERP to be paid at a later date
- Providing for accelerated vesting of the SERP over a shorter period.

The executive should request a severance pay provision in the event her employment contract is terminated through a change in control. Examples can include:

- Lump sum equal to multiple of salary and bonus
- Continuation of salary/bonus for a specified period of time

The executive should request a provision to address how her restricted stock will be handled in the event of change of control. Examples can include:

- All restricted stock vest immediately upon change in control.
- Restricted stock has accelerated vesting over a short period

The executive could request a provision to address how stock options and stock appreciation rights (SAR's) will be handled in the event of change in control

- All stock options / SAR's become immediately exercisable upon change in control.
- Stock options / SAR's become exercisable over a short period

The executive could request that any welfare benefits continue for a period of time (e.g. 1-3 years) following change in control

- Life insurance, long-term disability, medical benefits, etc.

The executive could request how to address any long-term incentive awards in the event of change in control.

- All long-term incentives vest immediately upon change in control.
- Long term incentives have accelerated vesting over a short period

Other options:
-The executive should ensure that all triggering events that make an executive entitled to golden parachute benefits are well defined. Triggering events typically include change in control provisions and/or termination of the executive's employment. There can be single or double trigger events.
-Change in control definition should provide details of what qualifies as change in control. Termination of employment must define the connection with the change in control.

12. **Learning Objectives:**

4. The candidate will be able to evaluate plan design risks faced by sponsors of retirement plans and retiree health plans.

5. The candidate will be able to evaluate sponsor's goals for the retirement plan, evaluate alternative plan types and features, and recommend a plan design appropriate for the sponsor's goals.

8. The candidate will be able to recommend and advise on the financial effects of funding policy and accounting standards in line with the sponsor's goals, given constraints.

Learning Outcomes:

(4a) Identify how plan features, temporary or permanent, can adversely affect the plans sponsor.

(4b) Assess the risk from options offered, including:
- (i) Phased retirement
- (ii) Postponed retirement
- (iii) Early Retirement
- (iv) Option factors
- (v) Embedded options
- (vi) Portability options

(5f) Design retirement programs that manage retirement risk and are consistent with sponsor objectives.

(5g) Design retirement programs that promote employee behavior consistent with sponsor objectives.

(5h) Evaluate the pros and cons from both a sponsor and employee perspective of introducing options that impact the labor force demographics.

(8e) Advise plan sponsors on accounting costs and disclosures for their retirement plans.

(8f) Demonstrate the sensitivity of financial measures to given changes in plan design.

Sources:

DA-154-15: Implementing Early Retirement Incentive Programs: A Step-by-Step Guide

DA-168-17: IFRS and US GAAP: Similarities and Differences, Ch 5 only

DA-157-17: PwC IFRS Manual of Accounting

DA-611-13: International Financial Reporting Standards

12. Continued

Commentary on Question:
Candidates generally performed well on parts (a) and (c). For part (b), successful candidates also considered the accounting implications on the retiree medical plan.

Solution:

(a) Describe business and legal considerations NOC should review to determine whether to offer an ERIP.

Business considerations:

- Prior to implementing an ERIP, NOC should first consider if a reduction of head count is actually necessary and if so, how that supports NOC's immediate and long term goals.
- NOC will need to establish eligibility criteria for the ERIP. For example, will 55/15 eligibility target individuals/areas that need to be impacted? Is this the right eligibility to use given what NOC wants to achieve?
- As a result of employees in the targeted group retiring, this can have a negative impact on NOC's operations if for example specialized knowledge is not transferred prior to their departure.
- NOC should consider whether or not involuntary lay-offs (targeting other individuals/groups) would better achieve NOC's goals than implementing voluntary ERIP program
- NOC should consider additional costs associated with ERIP (higher retiree medical & pension plan benefits) vs. costs of layoffs and severance

Legal considerations:

- NOC should be aware of all federal and state/provincial employment laws to eliminate any threat of law suits.
- Eligibility criteria of the ERIP can be viewed as employment discrimination on the basis of age which should be a concern to NOC. This however can be addressed in the employee's voluntary signed release form which NOC would prepare and provide.
- Adequate advanced notice would need to be provided to employees in the event of a mass layoff. Additionally, sufficient time should also be given to employees to respond.
- NOC should involve employment/benefits attorney during entire ERIP process.

(b) Describe the accounting implications under international accounting standard IAS 19, Rev. 2011, if NOC implements an ERIP.

No calculations required.

12. **Continued**

PENSION
The benefit is measured in accordance to the nature of the benefit provided – a termination benefit or post-employment benefit

Post-employment benefits are benefits conditional on future service being provided.

Under IFRS, benefits are classified as termination benefits, rather than post-employment benefits, if they have the following three characteristics

- Benefits are for a clearly defined period
- There is no legal or constructive obligation on the employer to extend the closing date.
- There is no linking of the amount of the amount of the benefit to length of future service

Termination benefits are recognized at the earlier of the following dates:

- When the entity can no longer withdraw the offer of the benefit, which is the earlier of
  -when the employee accepts the offer
  -when a restriction (legal, regulatory, contractual) on the entity's ability to withdraw the offer takes effect (ie, when the offer is made; if the restriction applies at the time of offer)
- When the entity recognizes costs for a restructuring that is within the scope of IAS 37 and involved the payment of termination benefits

Measurement – an entity should measure termination benefits on initial recognition and should measure and recognize subsequent changes in accordance with the nature of the employee benefit. If the termination benefits are an enhancement to postemployment benefits, the entity should apply the requirements for post-employment benefits. Otherwise, if the termination benefits are expected to be settled within 12 months after the end of the reporting period in which the termination benefit is recognized, the entity shall apply requirements of short-term employee benefits. If greater than 12 months, the entity shall apply requirements for other long-term employee benefits.

When an entity recognizes termination benefits, the entity may also have to account for a plan amendment or curtailment. Curtailment and plan amendment costs are measured at the same time termination benefits are recognized.

12. **Continued**

Curtailment is defined as a significant reduction in number of employees covered by the plan due to an isolated event, discontinuance of operation or termination/suspension of plan.

- The change in the re-measured DBO is the curtailment effect
- the cost is included with the past service cost in the service cost

Plan amendments are also immediately recognized with the service cost.

Other impacts:
-Increase in total pension expense due to expected higher DBO
-Lower service cost component of pension expense going forward
-Higher immediate expected cash flows could impact duration and discount rate
-ERIP will impact (likely hurt) funded status of pension plan
-Consider if other assumptions should change for employee wide assumptions – for example, salary scale, as longer service employees likely to have higher salary scale, does future expected salary scale change after ERIP removes some longer service employees.
-Should short term retirement assumption change for first few years following ERIP, as those very close to actually retiring may retire under ERIP for additional pension benefit and then the short term years after there will be a decrease in retirements. If no change, gains will be likely for each year retirements are assumed but not experienced.

<u>RETIREE MEDICAL</u>
Main impact on retiree medical plan is increased DBO since assumption is retirement at age 62 (loss from participants < 62 who retire under ERIP)

- All participants eligible for ERIP are already fully eligible for retiree medical plan benefits (55/10 requirement) so no curtailment triggered and no immediate PSC recognition
- All participants eligible for ERIP are getting same retiree medical benefits they would otherwise get at retirement so no accounting for special termination benefits.
- No re-measurement necessary for retiree medical plan (no plan amendment, settlement, curtailment, or special termination benefits)
- Retiree medical plan has loss which should be offset by gains in active medical plan. NOC should have net $0 benefit payment impact since medical plans are self-insured
- Increase in total retiree medical expense due to increase in pre-62 retirees
- Higher immediate expected cash flows could impact duration and discount rate
- Per capita claims cost assumption will likely need to be updated due to demographic shift after ERIP
- Lower service cost component of OPEB expense going forward

12. Continued

(c) Recommend two pension plan design enhancements for the National Oil Full-Time Salaried Pension Plan which could be included in the ERIP to enhance attractiveness of the program while mitigating the additional cost to NOC.

Justify your response.

Commentary on Question:
Candidates received points for other reasonable plan design enhancements not listed below.

Design 1: Add x years of credited service
- Results in larger retirement benefit for everyone in group
- Larger impact for shorter service than longer service employees
- More likely to incent those nearer age 65 than 55 to be able to retire with adequate retirement income

Design 2: Add x years to age (for purposes of early retirement reduction)
- Results in larger retirement benefits for most, but not all
- Has little to no impact on employees between ages 62 and 65 (already meet unreduced benefit criteria)
- More likely to incent those further from age 65 than closer

Design 3: Enhance early retirement factors (i.e. unreduced benefits at earlier age)
- Results in larger retirement benefits for most, but not all
- Has zero impact on employees between ages 62 and 65 (already meet unreduced benefit criteria)
- More likely to incent those further from age 65 than closer

Design 4: Assume final salaries are x% higher (to mimic expected final salary if didn’t retire early)
- Results in larger retirement benefit for almost everyone (no impact if hit salary cap – benefit would be more than $3,000 per YOS)
- Larger impact for lower paid than higher paid employees
- More likely to incent those nearer age 65 than 55 to be able to retire with adequate retirement income

13. **Learning Objectives:**

7. The candidate will be able to analyze/synthesize the factors that go into selection of actuarial assumptions.

9. The candidate will be able to apply the standards of practice and guides to professional conduct.

Learning Outcomes:

(7a) Evaluate appropriateness of current assumptions.

(7b) Describe and explain the different perspectives on the selection of assumptions.

(7c) Describe and apply the techniques used in the development of economic assumptions.

(7d) Recommend appropriate assumptions for a particular type of valuation and defend the selection.

(7e) Select demographic and economic assumptions appropriate for a projection valuation.

(9a) Apply the standards related to communications to plan sponsors and others with an interest in an actuary's results (i.e., participants, auditors etc.).

(9b) Explain and apply the Guides to Professional Conduct.

(9c) Explain and apply relevant qualification standards.

(9d) Demonstrate compliance with requirements regarding the actuary's responsibilities to the participants, plan sponsors, etc.

(9e) Explain and apply all of the applicable standards of practice related to valuing retirement obligations.

(9f) Recognize situations and actions that violate or compromise Standards or the Guides to Professional Conduct.

(9g) Recommend a course of action to repair a violation of the Standards or the Guides to Professional Conduct.

Sources:

DA-139-15: ASOP 35, Selection of Demographic and Other Noneconomic Assumptions for Measuring Pension Obligations

DA-142-15: ASOP 4, Measuring Pension Obligations

13. Continued

DA-614-17: Practice Specific Standards for Pension Plans 3100-3500, CIA Consolidated Standards of Practice

CIA Rules of Professional Conduct

SOA Code of Professional Conduct

DA-136-17: Selection of Actuarial Assumptions, Consultant Resource Manual, SOA Version, Mercer (excluding pp. 14-25, pp. 29-32 and pp. 68-109)

DA-162-16: Selecting and Documenting Mortality Assumptions for Pensions including Appendix 2 (Appendix 1 for background only)

Selection of Mortality Assumptions for Pension Plan Actuarial Valuations, CIA Education Note, March 2014

DA-167-17: ASOP 25: Credibility Procedures

Commentary on Question:
This question tests candidates' understanding of Code of Conduct violations when selecting appropriate assumptions.

Solution:
(a) Explain how changing a mortality table without analysis violates the Canadian Institute of Actuaries Rules of Professional Conduct.

Commentary on Question:
Most candidates answered part (a) well and provided the rule violations and rationale.

The request violates:
Rule 1 – Professional Integrity: A member shall act honestly, with integrity and competence, and in a manner to fulfil the profession's responsibility to the public and to uphold the reputation of the actuarial profession.

Reasons for violating Rule 1:
By using the incorrect mortality assumption, the member would be associated with false or misleading information (Annotation 1-2)

By using the incorrect mortality assumption, the member would be committing an act that could reflect poorly on the profession (Annotation 1-3)

13. Continued

Rule 6 – Control of Work Product: A member who performs *professional services* shall take reasonable steps to ensure that such services are not used to mislead other parties or to violate or evade the law.

Reasons for violating Rule 6:
By using the incorrect mortality assumption, the member would be willfully attempting to mislead other parties (such as financial analysts, etc.)

By using the incorrect mortality assumption, the member would not be ensuring the material is fairly presented (Annotation 6-1)

(b) Describe how the required statements of opinion in an external user report would need to be modified if the mortality assumption is adjusted based on the CFO's request.

Commentary on Question:
Most candidates answered this part well. Some candidates were not able to identify that the statement on accepted actuarial practice needed to be modified.

Alter the statement on assumptions to note that the assumptions were selected by the employer, not the actuary

Alter the statement on accepted actuarial practice in Canada to note that it has **not** been prepared in accordance with accepted actuarial practice in Canada.

(c) Describe the considerations in setting an appropriate mortality assumption.

Commentary on Question:
Most candidates described the considerations regarding current mortality and mortality improvement. Successful candidates also addressed considerations for setting mortality assumptions.

Need to consider both current levels of mortality and future mortality improvement

Consideration for current levels of mortality
Plan experience

- Need to consider credibility:
- If plan is large enough, can do mortality study and create customized mortality table or make an adjustment to current table
- For smaller plans, can analyse mortality experience and make an adjustment to current table or analyse mortality gains/losses from the valuation to validate assumption

13. **Continued**

If analysing plan mortality experience could:
- weight on benefits or headcount, depending on plan provisions and what weighting was used in the base table
- use the same methodology as the base table, and
- adjust experience studies to take into account mortality improvements (i.e., experience should be normalized to same base year)

Adjustments for plan characteristics

Can make adjustment on items such as:
- Blue collar or white collar,
- Private or public sector, and
- Size of pension
- Need to consider interactions if making adjustments on multiple plan characteristic and may not be appropriate to use multiple adjustments

Consideration for mortality improvement
The following items should be considered
- Analysing mortality improvement requires a large amount of data over a long period of time, which most plans don`t have
- Appropriate to use published mortality tables unless there is credible plan specific information
- Generational mortality is preferred as it decreases the chance the mortality becomes outdated
- Different mortality improvement scales can be used to project up to the measurement date and forward from the measurement date

Additional considerations
The following are additional items that can be considered
- May want to consider adjusted mortality for special situations such as pre-retirement death, disabled members, etc.
- Can consider using different mortality scales for pre and post retirement (or even no scale pre-retirement)
- Tables used should be based on insured annuitants instead of general population
  Mortality used for life insurance and annuities may be difference (life insurance tables contain loads)
- May need to use sex distinct tables, especially as unisex may violate ASOP 35
- Table used for an executive population covered by a SERP may differ from the table used for the general population