SOCIETY OF ACTUARIES

Retirement Benefits United States – Company/Sponsor Perspective

Exam CSP-RU

Date: Friday, April 29, 2011
Time: 8:30 a.m. – 1:15 p.m.

INSTRUCTIONS TO CANDIDATES

General Instructions

1. This examination has a total of 90 points.

   This exam consists of 11 questions, numbered 1 through 11.

   The points for each question are indicated at the beginning of the question. Questions 1 - 4, 6, and 9 - 10 pertain to the Case Study, which is enclosed inside the front cover of this exam booklet.
2. Failure to stop writing after time is called will result in the disqualification of your answers or further disciplinary action.
3. While every attempt is made to avoid defective questions, sometimes they do occur. If you believe a question is defective, the supervisor or proctor cannot give you any guidance beyond the instructions on the exam booklet.

Written-Answer Instructions

1. Write your candidate number at the top of each sheet. Your name must not appear.
2. Write on only one side of a sheet. Start each question on a fresh sheet. On each sheet, write the number of the question that you are answering. Do not answer more than one question on a single sheet.
3. The answer should be confined to the question as set.
4. When you are asked to calculate, show all your work including any applicable formulas.
5. When you finish, insert all your written-answer sheets into the Essay Answer Envelope. Be sure to hand in all your answer sheets since they cannot be accepted later. Seal the envelope and write your candidate number in the space provided on the outside of the envelope. Check the appropriate box to indicate Exam CSP-RU.
6. Be sure your written-answer envelope is signed because if it is not, your examination will not be graded.

CASE STUDY INSTRUCTIONS

The case study will be used as a basis for some examination questions. Be sure to answer the question asked by referring to the case study. For example, when asked for advantages of a particular plan design to a company referenced in the case study, your response should be limited to that company. Other advantages should not be listed, as they are extraneous to the question and will result in no additional credit. Further, if they conflict with the applicable advantages, no credit will be given.

****BEGINNING OF EXAMINATION****

Questions 1 – 4 pertain to the Case Study.

1. (*7 points*) NOC is considering amending the National Oil Full-Time Salaried Pension Plan as follows:

- Accruals will be provided under the plan during a period of disablement.
- Disability is defined as a period where the member is unable to work on account of illness or injury.
- The disability accruals would be based on credited service and earnings during the period of disablement.
- Earnings would be based on the earnings at the date of disablement increased by 5% each year during the period of disablement.
- The disability benefit would be payable at the normal retirement age.

(a) (*5 points*) Identify the risks to NOC associated with adding this disability provision to the plan.

(b) (*2 points*) Assuming this amendment is adopted, address the impact this would have on NOC's assumptions for funding purposes.

Questions 1 – 4 pertain to the Case Study.

2. (*8 points*) NOC is considering adding retiree contributions to the National Oil Full-Time Salaried and Union Retiree Health Benefit Program (the "Program") for future retirees. The benefits committee is considering two approaches:

1. Adding retiree contributions equal to a fixed 20% of the expected per capita claims as a monthly premium
2. Charging the excess of the expected per capita annual claims over $15,000 back to the retirees as an annual contribution

(a) (*5 points*) Identify the risks to NOC and the future retirees of introducing retiree contributions and compare the proposed approaches in terms of the impact on NOC.

(b) (*3 points*) Describe two other methods of introducing retiree cost sharing to the Program and explain how these methods might mitigate risk to the plan sponsor.

Questions 1 – 4 pertain to the Case Study.

3. (*6 points*) NOC recently hired a new CEO who participates in the National Oil Full-Time Salaried Pension Plan. The CEO is 45 years old and has been given the choice to either:

- Participate in the National Oil Full-Time Salaried Supplemental Retirement Plan (Option #1); or
- Receive 4 times his final annual base pay, excluding overtime and bonuses, as a single lump sum payment from the company's general assets two years after termination for any reason (Option #2).

Compare and contrast the risks to the CEO associated with each option.

Questions 1 – 4 pertain to the Case Study.

4. (*9 points*) The Board of Trustees for NOC's pension plans is considering limiting the pension fund investments for the National Oil Full-Time Salaried Pension Plan to passively managed funds designed to track the appropriate asset class benchmark ("index funds").

(a) (*3 points*) Describe the advantages and disadvantages of limiting the investments to index funds.

(b) (*6 points*) Assuming the pension fund investments are limited to index funds, outline an investment policy statement for the pension fund of the National Oil Full-Time Salaried Pension Plan.

5. (*6 points*) The CEO of XYZ Co. is considering adding company stock as an investment option to the qualified defined contribution pension plan XYZ Co. sponsors.

(a) (*3 points*) Describe the advantages and disadvantages of offering employer stock as an investment option under this plan.

(b) (*3 points*) Describe the fiduciary obligations of XYZ Co. with respect to the investment options offered under a qualified defined contribution pension plan.

Question 6 pertains to the Case Study.

6. (*8 points*) NOC is considering replacing the National Oil Full-Time Salaried Pension Plan with a defined contribution pension plan similar to the National Oil Part-Time DC Pension Plan for future service only. NOC has asked you to calculate a sample replacement ratio to assess the adequacy of the new plan.

The new DC provisions will provide employer matching contributions equal to 100% of the employee contributions to a maximum of 6% of salary.

Assumptions:
Salary Rate Increase: 3% per annum
Rate of Return on Assets: 6% per annum
Annuity factor at age 65: 13

Member A:
Age: 45
Annual earnings: $50,000
Employee contribution rate: 10% of pay
Frozen annual benefit payable at age 65 from the Salaried Plan: $10,000

Assume that salary increases and contributions are made on an annual basis.

(a) (*3 points*) Assuming the new DC provisions are adopted, calculate the income replacement ratio at age 65 for Member A. Show all work.

(b) (*5 points*) Recommend adjustments to the analysis in (a) that could be considered to more accurately assess benefit adequacy. Justify your recommendation.

7. (*8 points*) Your actuarial firm, QRS Ltd., has been retained to review an actuarial valuation prepared by ABC Consultants to ensure its compliance with the actuarial Standards of Practice in the United States.

Identify the specific items you would review and describe the criteria used in your evaluation.

8. (*8 points*)

(a) (*4 points*) Describe the advantages and disadvantages of each of the following risk-mitigating pension fund investment strategies:

- Cash Flow Matching
- Duration Matching
- Derivatives Overlay Strategy -- Interest Rate

(b) (*4 points*) Describe plan design strategies that can assist in mitigating pension plan financial risks and comment on how effective each strategy is in reducing the volatility of the funded status on an accounting basis.

Questions 9 – 10 pertain to the Case Study.

9. (*8 points*) The CEO of NOC has received a proposal from a multiemployer plan covering individuals who work in the oil industry. The multiemployer plan offers the same provisions and benefits as the National Oil Full-Time Hourly Union Pension Plan but for 75% of NOC's current expected employer contribution for the upcoming year.

(a) (*4 points*) As NOC's consulting actuary, describe the considerations that NOC should address when assessing the contribution levels of these two plans.

(b) (*4 points*) Assuming that NOC chooses to join the multiemployer plan, assess the risks to NOC and additional considerations that should be taken into account when making this decision.

Questions 9 – 10 pertain to the Case Study.

10. (*12 points*) NOC introduced the following changes to the National Oil Full-Time Salaried and Union Retiree Health Benefit Program on July 1, 2010:

Change 1:

- NOC terminates 1,250 active employees who had an obligation of \$100,000,000 and annual service cost of \$8,000,000. No one from this group is currently eligible for immediate retirement.
- As a result of this change, assume the expected remaining service life to full eligibility age and the expected remaining service life to retirement are both reduced by 25%.

Change 2:

- For all other employees, spousal coverage will be eliminated for any employees who retire after July 1, 2010.
- Decreases the plan's remaining obligation as of July 1, 2010 by 20%.
- Decreases the plan's remaining annual service cost by 40%.
- Expected benefit payments remain unchanged.

Assume the following:

- Change 1 will be accounted for first;
- the discount rate is unchanged from the rate as at January 1, 2010;
- retirement incidence is not expected to change as a result of Change 2;
- there is no other source of actuarial gains or losses since January 1, 2010; and
- the demographics of the active members remained unchanged from January 1, 2010.

Determine NOC's 2010 accounting expense under U.S. accounting standards including the effects of the plan changes. Show all work.

11. (*10 points*) The CFO of ABC Company wishes to adopt an asset allocation policy, including an asset allocation policy for its defined benefit pension plan, which maximizes shareholders' value. Shareholders who have a combined $20 billion invested in their individual portfolios own the company. Pension investments are transparent to shareholders and they rebalance their portfolios to maintain a 50% Equity / 50% Fixed Income mix. The shareholders have determined that their current total after-tax income, using the Augmented Balance Sheet approach, is $910 million.

ABC is considering a new investment policy for the defined benefit pension plan which it sponsors.

New Policy: 80% of the plan assets in equity investments, 20% of the plan assets in fixed income investments.

You are given the following data and assumptions:

- Pension plan assets: $3.0 billion

- Gross investment return assumptions:
  - ⇒ Equity investments: 7% per annum
  - ⇒ Fixed income investments: 4% per annum

- Corporate income tax rate: 30%

- Individual tax rates on investment income:
  - ⇒ Equity investments: 10% per annum
  - ⇒ Fixed income investments: 30% per annum

Changes in shareholders' equity, including returns on plan assets, flow through to investors and are taxed at 10%

Using the Augmented Balance Sheet approach, calculate the total after-tax income for the new policy and make a recommendation whether the proposed policy supports the CFO's goal. Show all work.

****END OF EXAMINATION****

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