SOCIETY OF ACTUARIES
Retirement Benefits United States – Company/Sponsor Perspective

Exam CSP-RU

Date: Friday, May 3, 2013
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 2, 5, 7, 8, 9, and 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

1. (*6 points*) A country has an insurance program that protects members of defined benefit pension plans against plan sponsor insolvency with provisions similar to the Pension Benefit Guaranty Corporation (PBGC) in the U.S. The program is significantly underfunded.

(a) (*3 points*) Explain why the program may be significantly underfunded.

(b) (*3 points*) Recommend changes that may improve the program's funded status. Justify your response.

Question 2 pertains to the Case Study.

2. (*8 points*) The CFO of NOC has mandated that NOC must reduce the size of all of its pension plans. The CFO has proposed the following:

Option 1: Add a permanent lump sum option for active members who retire

Option 2: Add a lump sum window for existing retirees and beneficiaries

Analyze these options from the perspectives of both NOC and NOC's employees.

3. (*8 points*) A country with no funding regulations is concerned that many corporate defined benefit pension plans within the country are poorly funded on a plan termination basis. The Government has proposed implementing new defined benefit funding regulations that would include the following:

(i) Funding liability interest rates to be based on corporate bond yields.

(ii) Plan sponsors to be permitted to use a three-year smoothed actuarial value of assets for funding purposes.

The regulations would be effective for plan years beginning in 2013.

(a) (*4 points*) Describe the advantages and disadvantages of using corporate bond yields to determine the funding liabilities versus the expected rate of return on plan assets.

(b) (*2 points*) Describe the advantages and disadvantages of using a smoothed actuarial value of assets versus the market value of assets for funding purposes.

(c) (*2 points*) Recommend additional regulations that would help the Government meet its goal of increasing the funded status of pension plans within the country.

4. (*10 points*) You are given the following information with respect to two companies:

	Company A	Company B
Company balance sheet		
Liabilities	$60,000,000	$900,000,000
Assets	$160,000,000	$950,000,000
Defined benefit pension plan		
Pension benefit obligation	$11,000,000	$850,000,000
Market value of assets	$10,000,000	$800,000,000
Pension fund asset allocation		
Equities	$6,500,000	$550,000,000
Fixed income	$3,500,000	$250,000,000
Company net income	$5,000,000	$20,000,000
Pension expense	$3,000,000	$10,000,000

(a) (*6 points*) Compare and contrast the financial risks to the following stakeholders of both companies:

(i) Plan sponsor

(ii) Plan members

(iii) Shareholders

(b) (*4 points*) A consultant has recommended that both companies invest 100% of pension fund assets in fixed income. Evaluate this recommendation.

Question 5 pertains to the Case Study.

5. (*11 points*) NOC is considering converting the Full-Time Salaried Pension Plan to a cash balance plan with the following provisions:

- Contribution credit of 5% of salary per year.
- Interest crediting rate is equal to the yield on one-year U.S. Treasuries, reset annually.
- Opening balance is equal to the present value of the accrued benefit as of the conversion date, determined using the current accounting discount rate and mortality assumptions.

(a) (*2 points*) Describe the impact of the proposed design on current employees, considering:

(i) Benefit accrual pattern

(ii) Vesting

(b) (*1 point*) Recommend how NOC could address potential wear-away as a result of the change.

(c) (*8 points*) The proposed program is implemented on July 1, 2013. Using the following information, calculate the impact on the 2013 pension expense:

- There are no gains or losses during the first half of the year.
- The change in plan design results in a decrease in the projected benefit obligation of $80 million as of July 1, 2013.
- The service cost is $20 million for the second half of the year.
- Benefit payments expected to be made during the second half of the year are $1.5 million in annuities and $115 million in lump sums.
- Total benefit payments expected to be paid during the year are $133 million.
- In the past, NOC has assumed all lump sums are paid at the end of the year in which settlement accounting is triggered.
- The average future service after the change decreases by two years.

6. (*7 points*)

(a) (*4 points*) Describe the process for performing a stochastic projection.

(b) (*3 points*) Your client sponsors a non-qualified pension plan that restores benefits lost due to regulatory limits. The plan is financed through taxable securities.

Describe the issues that need to be considered when performing a stochastic projection for this plan versus a qualified pension plan.

Question 7 pertains to the Case Study.

7. (*10 points*)

(a) (*3 points*) Describe the risks associated with the current asset mix of NOC's Full-Time Hourly Union Pension Plan.

(b) (*7 points*) The CFO of NOC proposes to move 45% of the current allocation to the following asset classes:

- Equities: 15%
- NOC shares: 15%
- Real estate: 15%

Describe the implications of this proposal as it relates to:

(i) Pension accounting

(ii) Fiduciary considerations

Question 8 pertains to the Case Study.

8. (*7 points*) NOC is concerned about the impact of rising health care costs on the sustainability of the Full-Time Salaried and Union Retiree Health Benefit Program. No changes to the retiree life insurance benefit are being contemplated at this time.

(a) (*2 points*) Propose two plan design approaches that would reduce NOC's exposure to health care cost inflation and explain how each would protect against rising health care costs.

(b) (*5 points*) NOC is considering changing the retiree health care benefit program by replacing the current program with a $250,000 lump sum payment at retirement.

Describe the risks with this approach from the perspectives of both NOC and NOC's employees.

Question 9 pertains to the Case Study.

9. (*8 points*)

(a) (*2 points*) Describe the key elements of a dynamic investment policy.

(b) (*4 points*) Describe the factors to be considered in employing a dynamic investment policy.

(c) (*2 points*) Describe a dynamic investment policy that NOC could apply to the Full-Time Salaried Pension Plan.

Question 10 pertains to the Case Study.

10. (*8 points*) The CFO of NOC wants to de-risk the Full-Time Salaried Pension Plan by changing the current asset mix.

(a) (*2 points*) Describe techniques to extend the duration of the current fixed income portfolio.

(b) (*2 points*) Calculate the duration extension needed to achieve a hedge ratio of 50%.

(c) (*4 points*) Given that current bond yields have been historically low, the CFO is concerned that it does not make sense to de-risk at this time.

Explain why adopting an LDI strategy may make sense even in a low bond yield environment.

11. (*7 points*) You are providing services to a new client whose prior actuary recently retired.

You have been provided the following sections of the last funding valuation report.

Plan Provisions:

• Vesting:	Immediate on retirement and death
• Benefit formula:	$80 per month times pensionable service
• Normal retirement age:	First of the month coincident or following age 65
• Early retirement reduction:	5% per year from age 65
• Normal form of pension:	Single life annuity if single; joint and survivor annuity if married
• Termination and death benefit:	Present value of accrued benefits
• Post-retirement indexing:	60% CPI each January 1st for retirements prior to September 1st before each increase

Assumptions:

• Interest rate:	7.5% per annum
• Inflation:	2.5% per annum
• Salary increases:	2.5% per annum (inflation plus merit and promotion)
• Retirement age:	Plan experience from the last 50 years
• Mortality:	GAM83 with full generational mortality projections
• Percent married:	50%
• Spousal age difference:	Male spouse 3 years younger than female spouse

11. Continued

Membership Data as of December 31, 2012:

Active Members

- Number: 555
- Average age: 42 years
- Average service: 15 years
- Average annual earnings: $43,000

Deferred Vested Members

- Number: 156
- Average age: 42 Years
- Average service: 9 years
- Average annual earnings at termination: $33,000

Retirees/Surviving Spouses/Beneficiaries

- Number
  - Retirees: 850
  - Surviving spouses: 200
- Average age: 72 years

Critique the plan provisions, assumptions and data sections of the report. Refer to the U.S. Standards of Practice in your response.

****END OF EXAMINATION****

USE THIS PAGE FOR YOUR SCRATCH WORK