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**SOCIETY OF ACTUARIES**  
**Design & Accounting Exam – U.S.**

# Exam RETDAU

## MORNING SESSION

**Date:** Thursday, October 30, 2014

**Time:** 8:30 a.m. – 11:45 a.m.

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### INSTRUCTIONS TO CANDIDATES

#### General Instructions

1. This examination has a total of 100 points. It consists of a morning session (worth 60 points) and an afternoon session (worth 40 points).

a) The morning session consists of 7 questions numbered 1 through 7.

b) The afternoon session consists of 7 questions numbered 8 through 14.

The points for each question are indicated at the beginning of the question. Questions 1, 4, 6, 7, 13 and 14 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 because 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 morning or afternoon session for Exam RETDAU.
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\*\***  
**Morning Session**

*Question 1 pertains to the Case Study.*

- 1.** (12 points) In order to reduce the cost of post-retirement medical benefits, NOC is considering offering participants in the NOC Full-Time Salaried and Union Retiree Health Benefit Program who retire on or after January 1, 2015 the following two options upon retirement:
- Option 1: Receive \$200,000 cash at retirement and forego post-retirement medical benefits
- Option 2: Receive the current post-retirement medical benefits, but with the retiree contributing 10% of the cost
- (a) (1 point) Describe anti-selection and how it may affect the cost implications of NOC's decision.
- (b) (5 points) If NOC makes this offer to participants,
- (i) Describe how the assumptions used to determine the Benefit Obligation and Service Cost would be affected, and
- (ii) Propose reasonable changes to each assumption.
- (c) (6 points) Describe the risks of these two options from the perspectives of both NOC and the retirees.

2. (8 points) ABC Pension Plan is a multiemployer plan representing hourly employees of various oil companies. The Union of Oil Employees (“Union”) has proposed that XYZ Oil Company join the ABC Pension Plan effective January 1, 2015. XYZ employees will earn benefit accruals for service prior to January 1, 2015 because they were not previously part of a pension plan.

You have been provided the following information regarding the active employee populations:

	XYZ	ABC Pension Plan
Number	8,000	100,000
Average age	40	45
Average service	15 years	17 years

Assume that tax restrictions do not apply.

- (a) (5 points) Describe the advantages and disadvantages of allowing XYZ to participate in the ABC Pension Plan from the perspectives of:
- (i) ABC Pension Plan active and inactive plan participants
  - (ii) XYZ active employees
  - (iii) XYZ
- (b) (3 points) Describe plan design alternatives that may be used to reduce the costs involved in providing benefit accruals for service prior to January 1, 2015.

3. (10 points) You have been provided the following information with respect to the accounting results of a non-contributory defined benefit pension plan:

	As of December 31, 2013
Benefit obligation	
- Active members	\$8,000,000
- Retired members	\$4,000,000
Market value of plan assets	\$10,000,000
Net defined benefit (liability)/asset	(\$2,000,000)

**Assumptions for 2014:**

Employer current service cost (end of the year)	\$2,000,000
Employer contribution	\$3,000,000
Benefit payments:	
- Terminations and deaths	\$50,000 per month
- Pensions	\$50,000 per month
Accounting discount rate	4.5% per year at all measurement dates
Actual return on plan assets	4.5% during 2014

- (a) (3 points) Describe the risks of an annuity buy-in and an annuity buy-out from the perspectives of the plan members and the plan sponsor.
- (b) (7 points) You are given the following information:

Cost of annuity buy-out	\$5,200,000 as of July 1, 2014
Cost of annuity buy-in	\$5,000,000 as of July 1, 2014

Calculate the estimated 2014 Net Periodic Benefit Cost under the following scenarios:

- (i) Annuity buy-in for all current retirees as at July 1, 2014.
- (ii) Annuity buy-out for all current retirees as at July 1, 2014.

Show all work.

**Question 4 pertains to the Case Study.**

- 4.** (6 points) Gevrey is implementing social insurance systems modeled after U.S. Social Security and Medicare. NOC intends to integrate the NOC Full-Time Salaried Pension Plan (Salaried Plan) with the new government-provided pension plan.

In addition, NOC intends to integrate the NOC Full-Time Salaried and Union Retiree Health Benefit Program (Health Plan) with the new government-provided health care plan.

- (a) (4 points)
- (i) Explain the reasons NOC would want to integrate the Salaried Plan with the government-provided pension plan.
  - (ii) Explain the plan design difficulties NOC may encounter when integrating the Salaried Plan with the government-provided pension plan.
- (b) (2 points) Describe three methods to integrate the Health Plan with the government-provided health care plan.

- 5.** (8 points)

- (a) (1 point) Describe three reasonable approaches for calculating final average earnings under a phased retirement program.
- (b) (4 points) Describe the legal, human resources, and financial issues of phased retirement.
- (c) (3 points) Assess how accounting valuation assumptions may be impacted if a company were to implement a phased retirement program.

***Question 6 pertains to the Case Study.***

- 6.** (9 points) NOC is trying to close their accounting books for the December 31, 2014 year-end and requires entries for the NOC Full-Time Salaried Pension Plan (Salaried Plan). You have been asked to roll the liabilities forward from the last valuation using updated interest rates.

You have been provided the following information:

- The discount rate at December 31, 2014 has decreased to 4.75% per year
  - The duration of the plan liabilities is the same as at January 1, 2014
  - The asset return in 2014 was \$200,000 less than expected
  - Actual 2014 benefit payments were \$40,000
  - There are no other gains or losses during 2014
  - Benefit payments and contributions remain at the same level in 2015
  - The average expected future life remains the same
- (a) (3 points) Calculate the funded status and the Accumulated Other Comprehensive Income recognized in the statement of financial position at December 31, 2014. Show all work.
- (b) (2 points) Calculate the estimated 2015 Net Periodic Benefit Cost. Show all work.
- (c) (4 points) Outline the non-financial items that should be included in your report to NOC.

***Question 7 pertains to the Case Study.***

- 7.** (7 points) NOC wants to incorporate risk-sharing features into its retirement benefits programs.
- (a) (2 points) Describe the risk-sharing features in the industry-wide career pay plans in the Netherlands.
  - (b) (2 points) Describe the potential effect of implementing the risk-sharing features identified in part (a) in the NOC Full-Time Salaried Pension Plan (Salaried Plan).

NOC is also considering incorporating choice between joining the Salaried Plan or a defined contribution pension plan.

- (c) (3 points) Describe employer considerations in providing employees with this choice.

**\*\*END OF EXAMINATION\*\***  
**Morning Session**

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