Society of Actuaries Course 8RU Fall 2003

****BEGINNING OF EXAMINATION 8****
COMPREHENSIVE SEGMENT – U.S.
MORNING SESSION

All Questions pertain to the Case Study

1. *(7 points)* A NOC executive with 30 years of service plans to retire one year from now at age 62. It is important to NOC that the executive transitions to retirement over the next four years.

(a) Describe the benefit incentives that can be offered to help retain this executive.

(b) If you were hired by this executive, provide your recommendation regarding the negotiation of benefits.

(c) Explain how your answer to (a) would be different if the executive had only eight years of service with NOC.

(d) Identify the additional considerations that would exist if, instead of being hired by the executive, you were hired by NOC to provide advice to the executive.

All Questions pertain to the Case Study

2. *(11 points)* On June 30, 2003, NOC purchased a non-participating annuity contract to cover the obligations of all the pensioners in the Full-Time Hourly Union Pension Plan.

You are given:

- The contract cost was $125 million.
- As of June 30, 2003, NOC has recorded half of its 2003 pension expense and contributed half of its 2003 contribution.
- A discount rate of 6.0% was appropriate on June 30, 2003.
- Valuation results as of June 30, 2003, immediately before the annuity purchase:

	Using a 6.5% Discount Rate	**Using a 6.0% Discount Rate**
	(*All dollars in 000's*)	
PBO		
Active participants	$377,000	$400,000
Deferred vested participants	0	0
Pensioners	103,000	108,000
Total PBO	$480,000	$508,000
Service Cost	$24,000	$28,000
Market value of assets	$320,000	$320,000
Average remaining service period	11.5	11.5

(a) *(5 points)* Calculate the pension expense for the year 2003. Show all work.

(b) *(1 point)* Describe the additional considerations if a participating annuity contract were purchased.

(c) *(3 points)* Explain how your answer to (a) would differ under IAS 19 and the rationale for the different requirements.

(d) *(2 points)* Describe the information NOC will have to provide the insurer for the purpose of obtaining a quote for the annuity contract.

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3. *(6 points)* NOC's Board of Directors has established the following funding policy for NOC's DB ERPs: annual contributions equal to normal cost plus five-year amortization of unfunded actuarial accrued liability. The CFO of NOC is concerned about the volatility of funding policy contributions.

(a) Explain the effects of different asset valuation methods on this volatility.

(b) Explain the effects of different asset class allocations on this volatility.

All Questions pertain to the Case Study

4. *(12 points)* The law in Vosne has been changed to permit voluntary employee contributions of up to 5% of pay to a DC ERP. The tax treatment of these contributions is the same as for contributions to a PPA.

NOC has decided to change the Full-Time Hourly Union Pension Plan from a flat dollar plan to a final average earnings plan, and to add a DC ERP for the union employees.

The main provisions of the new plans are:

<u>DB ERP</u>

Normal retirement benefit:	1% of final five-year average earnings times years of service
Post retirement indexing:	3% per year
Optional form of benefit:	Lump Sum

The other provisions of the plan are the same as those in the NOC Full-Time Hourly Union Pension Plan.

<u>DC ERP</u>

Employee Contributions:	Voluntary
Matching Employer contributions:	100% match on the first 3% of employee contributions
Form of Benefit:	Lump sum or periodic pension

(a) Critique the design of the new plans from the perspective of NOC.

(b) Critique the design of the new plans from the perspective of the hourly union employees.

(c) Assess the current hourly plan asset allocation for the new DB plan.

(d) Describe the considerations in setting investment options to be offered to participants in the DC ERP.

(e) Predict the socio-economic effects of the change in the law in Vosne.

All Questions pertain to the Case Study

5. *(6 points)* NOC has just established a global subsidiary. Employees of the subsidiary include transferred NOC employees and third-country nationals.

(a) Explain the issues affecting a retirement benefit policy for permanent and temporary transfers between countries.

(b) Assuming that global comparability of retirement benefits is a corporate objective, describe the issues NOC must consider.

All Questions pertain to the Case Study

6. *(10 points)* NOC's CEO has proposed an asset mix policy for the Full-Time Hourly Union Pension Plan to achieve the following objectives:

- Minimize short-term volatility of the company's pension expense.
- Minimize the long-term cost of the plan.

<u>Proposed Asset Mix Policy</u>

Domestic Equities (mostly oil companies)	60%
International Equities	5%
Domestic Fixed Income (short & medium-term treasuries)	20%
Real Estate	15%

(a) Critique the proposed asset mix policy.

(b) You are going to perform an asset liability study for the NOC Full-Time Hourly Union Pension Plan. Describe the inputs you would need and the process you would undertake.

(c) Explain how the output of your asset liability study would be used to recommend and justify an asset mix policy to the CEO.

7. *(8 points)* NOC is acquiring TechCo, a private company in the country of Xanadu.

Xanadu has similar tax and pension legislation rules to Vosne, with the following exceptions:

- Employees can contribute up to $5,000 per year to a DB ERP and $5,000 per year to a DC ERP.
- Employee contributions are tax-deductible to the individual.
- Investment earnings on the employee contributions are not taxable until withdrawn.
- There are no PPAs.

Xanadu sponsors the following government-provided retirement income program:

- Both employees and employers contribute 5% of pay every year.
- The pension provided at retirement is equal to 50% of the best 3-year average earnings, provided the contributory period was at least 30 years. A proportionately reduced benefit is provided if less than 30 years of contributions were made to the program.
- Eligibility for a pension is age 62.
- The pension is reduced by 5% per year that the retirement age precedes age 67.

TechCo did not provide either a DB ERP or a DC ERP.

(a) Evaluate the appropriateness of NOC establishing an ERP for the salaried employees of TechCo.

(b) NOC's VP of Human Resources is proposing a plan with the same provisions as the Full-Time Salaried Pension Plan. Critique this proposal.

(c) Recommend an alternative program for the salaried employees of TechCo. Justify your recommendation.

****END OF EXAMINATION****
MORNING SESSION

****BEGINNING OF EXAMINATION 8****
COMPREHENSIVE SEGMENT – U.S.
AFTERNOON SESSION

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8. *(8 points)* NOC is considering laying off part of its union workforce to reduce costs. In order to avoid layoffs, the union has agreed to discuss changes to the Full-Time Hourly Union Pension Plan.

NOC has proposed to freeze accruals in the pension plan as of September 30, 2003. Under the frozen plan, benefits would be determined for all active participants based on service earned through September 30, 2003, and no future benefits would accrue.

The union offers a counter proposal to reduce future accruals as of January 1, 2004. Under the union's proposal, benefits would accrue to December 31, 2003 at the $75 rate. After December 31, 2003, benefits would accrue at a rate of $50 per year of service earned after December 31, 2003.

(a) Estimate the change in NOC's 2003 accounting expense if NOC's proposal is adopted.

(b) If the union proposal is adopted, estimate the change in the 2003 and the 2004 accounting expense.

(c) Describe the effect of NOC's proposal from both the employee and the employer perspectives.

All Questions pertain to the Case Study

9. *(15 points)* NOC is purchasing a refinery from ABC Company, and will offer employment to all of the employees at the refinery. All refinery employees are members of the ABC Refinery Pension Plan and the ABC Refinery Post-Retirement Medical plan. There are no other members of these plans.

You are given:

Provisions of the ABC Refinery Plans

The ABC Refinery Pension Plan provisions are as follows:

- Normal Retirement Age: Age 65
- Early Retirement Age: Age 60
- Normal Retirement Benefit: 1.75% of final earnings times years of service
- Early Retirement Reduction: Actuarially equivalent
- Normal Form of Benefit: If married, 50% joint & survivor, without reduction. If not married, single life annuity
- Post-Retirement Indexing: Lesser of 1% or CPI
- Termination and Pre-Retirement Death Benefits: Lump sum value of the accrued benefit, excluding indexation.

The ABC Refinery Post-Retirement Medical Plan provisions are exactly the same as NOC's.

9. **Continued**

January 1, 2003 Membership Data – ABC Refinery Plans

The membership demographics of the refinery's employees are described in the following table:

Age		<5 years of service	5-10 years of service	>10 years of service	Total
<55	# Participants	50	100	50	200
	Avg Salary	40,000	42,000	46,000	42,500
55-65	# Participants	500	1,500	2,500	4,500
	Avg Salary	44,000	48,000	50,000	51,444
>65	# Participants	150	350	250	750
	Avg Salary	47,000	52,000	57,000	52,667
Total	# Participants	700	1,950	2,800	5,450
	Avg Salary	44,357	48,410	55,018	51,284

The ABC Refinery Plans have no retirees.

9. Continued

January 1, 2003 Accounting Valuation Results for the ABC Refinery Plans

	Pension Plan	Post-Retirement Medical Plan
Market value of assets	$350,000,000	$0
PBO/APBO		
Active members	$325,000,000	$280,000,000
Inactive members	0	0
Total	$325,000,000	$280,000,000
Service Cost	$21,000,000	$15,000,000

Assumptions and Methods

Interest	8.5%
Salary scale	5.0%
Mortality	GAM83
Turnover	None
Retirement	100% at age 62
Asset valuation method	Market Value
Actuarial cost method	Projected unit credit

9. **Continued**

Provisions of the Draft Purchase and Sale Agreement

The main provisions of the draft purchase and sale agreement, prepared by ABC, for discussion with NOC, are:

Pension Benefits

- Accrued benefits under the ABC Refinery Pension Plan will become the responsibility of NOC under its Full-Time Salaried Pension Plan.
- ABC will transfer the ABC Refinery Pension Plan assets to the NOC plan, subject to regulatory approval
- NOC is required to provide "substantially similar" pension benefits for refinery employees following the sale date.

Post – Retirement Medical Benefits

- NOC will be responsible for providing retiree medical benefits for refinery employees.
- ABC will make a lump sum cash payment to NOC equal to the accounting liabilities for post-retirement medical benefits determined using the ABC accounting assumptions.

Analyze the terms of the agreement and recommend revisions. Justify your recommendation.

All Questions pertain to the Case Study

10. *(7 points)* The CEO of NOC is targeting a substantial reduction in operating expenses. Three alternatives are being considered:

(i) An employee lay-off with severance benefits.

(ii) A temporary early retirement pension enhancement.

(iii) Phased-retirement.

(a) Describe advantages and disadvantages of each alternative.

(b) Describe the accounting implications of each alternative.

****END OF EXAMINATION****
AFTERNOON SESSION