

EDUCATION AND EXAMINATION COMMITTEE
OF THE
SOCIETY OF ACTUARIES

COURSE 8 RETIREMENT BENEFITS STUDY NOTE

COURSE 8 RETIREMENT BENEFITS CASE STUDY

This case study will be used as a basis for 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 the 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.

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Course 8 - Retirement Benefits

Case Study

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National Oil Company - Background

National Oil Company (NOC) is a large well-established company that services oil wells all over the country of Belair. NOC has been in existence for over 30 years and has more than 10,000 full-time salaried and union hourly employees and up to a further 5,000 non-skilled seasonal employees during the non-winter months. Approximately one-half of the seasonal employees return for another season. The full-time workforce is reasonably stable, but turnover in the last 5 years has been greater than desired, due to competitors recruiting NOC's employees.

Normally, an undergraduate degree is a minimum requirement to obtain entry to the salaried workforce and many employees have graduate degrees. About half of NOC's salaried employees are recruited directly from university with the other half coming from competitors.

The company's financial position varies with the price of oil. As oil prices rise, oil companies become increasingly active and in turn require the services of NOC. Conversely, activity slows as oil prices drop. Despite this, the company is usually in a taxable position.

NOC has managed to be successful by staying on the cutting edge of technology. NOC prides itself in being state of the art in processes and software relevant to its industry. This has helped it to stave off competition from both inside and outside of Belair. Although NOC is the largest player in the industry within Belair, there are larger players from outside of the country, with which NOC has to compete. From time to time, there are rumors of a takeover of NOC.

Country of Belair – Background

Belair is a modern developed country with a simplified tax system. Both corporations and individuals are subject to income tax at a flat rate of 40%. Reasonable operating expenses, including contributions to Eligible Retirement Plans (ERPs), reduce taxable income.

No pension legislation exists apart from the rules outlined herein.

Rules that apply to gain ERP status are as follows:

General

- if a company has one or more ERPs, then all employees are entitled to be in at least one of the company's ERPs.

Defined Benefit Plans (DB ERPs)

- employer contributions may not exceed those recommended by an actuary, in accordance with generally accepted actuarial practice
- employer contributions are an eligible expense to reduce the employer's taxable income
- periodic pensions may not exceed \$3,000 per annum for each year of service regardless of form or commencement age
- periodic pensions cannot commence prior to age 55
- investment earnings generated by the ERP pension fund are not taxable
- pension payments are taxed as received in the hands of the recipient
- no employee contributions are permitted

Defined Contribution Plans (DC ERPs)

- employer contributions for any individual plan member cannot exceed \$20,000 annually
- employer contributions are an eligible expense to reduce the employer's taxable income
- investment earnings generated by the ERP pension fund are not taxable until withdrawn
- benefit distributions are taxed as received in the hands of the recipient
- no employee contributions are permitted

Belair's tax system also encourages individuals to save for their retirement through a Personal Pension Account (PPA). The tax rules for PPAs are as follows:

Personal Pension Accounts

- individuals may contribute up to \$20,000 annually to a PPA on a defined contribution basis
- such contributions are tax deductible to the individual
- in addition to the annual contribution limit, individuals may transfer their ERP lump sum termination benefit into their PPA in which case the ERP lump sum is excluded from taxable income until withdrawn from the PPA
- investment earnings on PPAs are not taxable until withdrawn
- withdrawals are subject to tax in the hands of the individual

The tax assistance available under each of the above three arrangements does not depend on the extent of participation under the other two. For example, an individual could participate in a PPA and, if eligible under the plans' rules, also in both a DB ERP and a DC ERP of his or her employer.

Supplemental Retirement Plans (SRPs)

Contributions to a retirement plan that does not meet ERP status are not tax-deductible. Benefits paid to participants under such plans are tax deductible to the company and are taxable to participants, when paid to participants. Such a plan is known as a Supplemental Retirement Plan (SRP). An example of an SRP is a plan that restores the benefits lost by the imposition of the ERP maximums.

Retiree Health Care Plans

Employers in Belair may provide health care benefits to retirees and their spouses through a separate plan which is not intended to qualify for ERP status. Benefits (including insurance premiums) paid under such plans are tax deductible to the company when paid on behalf of participants. Benefits are not taxable to plan participants at any time.

* * *

No social security pension system exists in Belair and there are no state-provided life or health-care benefits.

For financial reporting purposes, Belair has adopted International Accounting Standard No. 19 (IAS 19).

The investment market in Belair is well developed, with substantial trading in government and corporate bonds and equities.

Summary of National Oil's Retirement Benefits

NOC maintains three defined benefit plans:

1. a final-average pay defined benefit (DB) ERP for its full-time salaried employees;
2. a unit benefit DB ERP for its full-time hourly union staff; and
3. a non-eligible pension plan (referred to as the SRP) for its executives that is supplemental to the salaried ERP. This plan has no assets.

In addition, the company has a defined contribution ERP for its seasonal workforce.

Furthermore, full-time salaried and union employees retiring with the company are covered for their lifetime by health benefits.

Extracts of Retirement Benefits Provisions and Financial Information

National Oil Full-Time Salaried Pension Plan

| | |
|------------------------------|---|
| Eligibility | Immediate |
| Vesting | 100% after 5 years of service |
| Normal Retirement Age | 65 |
| Early Retirement Age | 55 with 5 years of service |
| Best Average Earnings | Average annual earnings during 60 consecutive months in which earnings were highest |
| Earnings | Basic pay, excluding overtime and bonuses |
| Normal Retirement Benefit | 2% of best average earnings times years of service, subject to tax system maximum |
| Accrued Benefit | Benefit calculated as under the normal retirement benefit formula using best average earnings and service as of date of calculation |
| Early Retirement Benefit | Accrued benefit reduced by 0.25% per month that early retirement precedes age 62 |
| Form of Benefit | If married, 50% joint & survivor benefit, without reduction. If not married, single life annuity |
| Optional Forms of Benefit | None |
| Indexing | None |
| Termination Benefit | Lump sum equal to actuarial present value of accrued benefit |
| Pre-Retirement Death Benefit | Lump sum equal to actuarial present value of accrued benefit payable to named beneficiary |
| Disability Benefit | None |

National Oil Full-Time Salaried Pension Plan
Historical Actuarial Valuation Results

1997 1998 1999 2000

Participant Summary - January 1

| | | | | |
|---|--------|--------|--------|--------|
| <i>Active Participants</i> | | | | |
| (a) count | 3,375 | 3,450 | 3,500 | 4,000 |
| (b) average age | 44.6 | 44.8 | 45.0 | 44.6 |
| (c) average service | 14.9 | 15.0 | 15.2 | 14.2 |
| (d) average future working lifetime | 11.0 | 10.9 | 10.7 | 11.8 |
| (e) average plan earnings (prior year, capped at \$150,000) | 52,000 | 54,200 | 57,800 | 58,000 |
| <i>Deferred Vested Participants</i> | | | | |
| (a) count | - | - | - | - |
| <i>Pensioners (incl beneficiaries)</i> | | | | |
| (a) count | 460 | 480 | 510 | 525 |
| (b) average age | 68.1 | 68.9 | 69.6 | 70.5 |
| (c) average annual benefit | 18,000 | 18,300 | 18,600 | 18,700 |

Plan Assets

| | | | | |
|---|--------------|--------------|--------------|--------------|
| <i>Change in Plan Assets during Prior Year:</i> | | | | |
| Market Value of Assets at January 1 of prior year | 325,000,000 | 391,335,738 | 372,165,851 | 479,905,792 |
| Employer Contributions during prior year | 18,000,000 | - | 22,000,000 | - |
| Benefit Payments during prior year | (10,811,250) | (11,457,750) | (12,286,000) | (13,117,500) |
| Expenses during prior year | - | - | - | - |
| Investment return during prior year | 59,146,988 | (7,712,137) | 98,025,941 | 85,202,468 |
| Market Value of Assets at January 1 of current year | 391,335,738 | 372,165,851 | 479,905,792 | 551,990,760 |
| Rate of return during prior year | 18% | -2% | 26% | 18% |
| <i>Average Portfolio Mix During Prior Year:</i> | | | | |
| (a) Domestic Large Cap Equities | 35% | 37% | 39% | 36% |
| (b) Domestic Small Cap Equities | 25% | 24% | 23% | 23% |
| (c) Domestic Fixed Income | 25% | 24% | 23% | 24% |
| (d) International Equities | 9% | 8% | 8% | 11% |
| (e) Real Estate | 3% | 4% | 4% | 3% |
| (f) Cash | 3% | 3% | 3% | 3% |
| (g) Total | 100% | 100% | 100% | 100% |
| <i>Asset Class Returns during Prior Year:</i> | | | | |
| (a) Domestic Large Cap Equities | 30% | -3% | 43% | 17% |
| (b) Domestic Small Cap Equities | 9% | -12% | 26% | 32% |
| (c) Domestic Fixed Income | 14% | 5% | 6% | 9% |
| (d) International Equities | 12% | 7% | 21% | 18% |
| (e) Real Estate | 18% | 3% | 3% | 10% |
| (f) Cash | 4% | 3% | 3% | 3% |

National Oil Full-Time Salaried Pension Plan
Historical Actuarial Valuation Results

1997 1998 1999 2000

Funding Valuation - January 1

| | | | | |
|--|--------------|--|--------------|---------------|
| 1. Actuarial Accrued Liability: | | | | |
| (a) Active participants | 265,793,650 | 296,908,098 | 325,570,240 | 368,341,138 |
| (b) Deferred vested participants | - | - | - | - |
| (c) Pensioners | 74,520,000 | 77,299,200 | 81,579,600 | 82,467,000 |
| (d) Total | 340,313,650 | 374,207,298 | 407,149,840 | 450,808,138 |
| 2 Actuarial Value of Assets | 391,335,738 | 372,165,851 | 479,905,792 | 551,990,760 |
| 3. Unfunded Actuarial Accrued Liability: (1d)-(2) | (51,022,088) | 2,041,447 | (72,755,952) | (101,182,622) |
| 4. Normal Cost (beg. Of year) | 17,838,500 | 19,793,873 | 21,419,095 | 25,939,517 |
| 5. Change in Unfunded AAL during prior year: | | | | |
| (a) Unfunded AAL at prior valuation date | (8,250,000) | (51,022,088) | 2,041,447 | (72,755,952) |
| (b) Adjustment for Interest | (660,000) | (4,081,767) | 163,316 | (5,820,476) |
| (c) Normal Cost w/interest less contributions | (2,400,000) | 19,265,580 | (622,617) | 23,132,622 |
| (d) (Gain)/Loss on investment | (32,859,438) | 38,560,685 | (67,864,113) | (47,334,704) |
| (e) (Gain)/Loss on termination | (2,000,000) | (500,000) | (300,000) | 1,000,000 |
| (f) (Gain)/Loss on salary increases less than expected | (7,450,000) | (780,000) | (5,000,000) | 50,000 |
| (g) (Gain)/Loss on mortality | 250,000 | 100,000 | (300,000) | 150,000 |
| (h) (Gain)/Loss on retirement | 1,500,000 | 300,000 | 225,000 | (200,000) |
| (i) (Gain)/Loss on expenses | - | - | - | - |
| (j) (Gain)/Loss on all other factors | 847,350 | 199,037 | (1,098,985) | 595,888 |
| (k) Unfunded AAL at current valuation date | (51,022,088) | 2,041,447 | (72,755,952) | (101,182,622) |
| 6. Actuarial Basis | | | | |
| (a) Interest | 8.00% | 8.00% | 8.00% | 8.00% |
| (b) Salary scale | 5.00% | 5.00% | 5.00% | 5.00% |
| (c) Consumer Price Index | 3.50% | 3.50% | 3.50% | 3.50% |
| (d) Mortality | | GAM83 | | |
| (e) Turnover | | Based on NOC experience for 1986-1988 | | |
| (f) Retirement age | | Age 62 | | |
| (g) Proportion married and age difference | | 80% married, husbands 3 years older than wives | | |
| (h) Expenses | | Assume all expenses paid by company | | |
| (i) Asset Valuation Method | | Market value of assets | | |
| (j) Actuarial Cost Method | | Projected unit credit | | |

National Oil Full-Time Salaried Pension Plan
Historical Actuarial Valuation Results

1997 1998 1999 2000

Expense Valuation - January 1

| | | | | |
|---|---------------------|--|---------------------|----------------------|
| <i>1 Reconciliation of funded status at valuation date:</i> | | | | |
| (a) Obligations: | | | | |
| (i) accrued benefit obligation | (232,580,819) | (265,045,994) | (272,735,197) | (293,025,290) |
| (ii) projected benefit obligation | (387,634,698) | (407,763,068) | (474,322,082) | (450,808,138) |
| (b) Market Value of Assets | 391,335,738 | 372,165,851 | 479,905,792 | 551,990,760 |
| (c) Surplus: (a)(ii) + (b) | 3,701,041 | (35,597,217) | 5,583,710 | 101,182,622 |
| (d) Unrecognized (gains)/losses | <u>(33,701,041)</u> | <u>(8,375,382)</u> | <u>(47,145,801)</u> | <u>(158,574,388)</u> |
| (e) Prepaid/(Accrued) expense | (30,000,000) | (43,972,599) | (41,562,091) | (57,391,766) |
| <i>2. Pension Expense:</i> | | | | |
| (a) Service Cost (beg of year) | 20,514,275 | 21,773,261 | 25,167,436 | 25,939,517 |
| (b) Interest Cost | 28,192,034 | 31,785,559 | 33,300,890 | 37,615,112 |
| (c) Expected return on assets | (34,733,710) | (33,969,328) | (42,638,651) | (49,088,881) |
| (d) Recognition of prior service cost | - | - | - | - |
| (e) Amortization of unrecognized (gain)/loss | - | - | - | <u>(8,760,620)</u> |
| (f) Pension Expense for year | <u>13,972,599</u> | <u>19,589,492</u> | <u>15,829,675</u> | <u>5,705,128</u> |
| <i>3 Actuarial Basis</i> | | | | |
| (a) Discount rate | 7.00% | 7.50% | 6.75% | 8.00% |
| (b) Return on assets | 9.00% | 9.00% | 9.00% | 9.00% |
| (c) Salary scale | 4.50% | 5.00% | 4.25% | 5.00% |
| (d) Consumer Price Index | 3.50% | 3.50% | 3.50% | 3.50% |
| (e) Mortality | | GAM83 | | |
| (f) Turnover | | Based on NOC experience for 1986-1988 | | |
| (g) Proportion married and age difference | | 80% married, husbands 3 years older than wives | | |
| (h) Retirement age | | Age 62 | | |
| (i) Expenses | | Assume all expenses paid by company | | |
| (j) Asset Valuation Method | | Market value of assets | | |
| (k) Actuarial Cost Method | | Projected unit credit | | |

**National Oil Full-Time Salaried Pension Plan
Reconciliation of Plan Participants (1997-2000)**

| | <u>Active</u> | <u>Pensioners/ Beneficiaries</u> | <u>Total</u> |
|--|---------------|--------------------------------------|--------------|
| 1. Participants as of January 1, 1997 | 3,375 | 460 | 3,835 |
| - New Entrants/Rehires | 309 | - | 309 |
| - Terminated Nonvested | (85) | - | (85) |
| - Terminated Vested (Lump Sum Cashout) | (125) | - | (125) |
| - Retirement | (22) | 22 | - |
| - Death w/ Beneficiary | (2) | 2 | - |
| - Death w/o Beneficiary | - | (4) | (4) |
| - Net change | 75 | 20 | 95 |
| 2. Participants as of January 1, 1998 | 3,450 | 480 | 3,930 |
| - New Entrants/Rehires | 380 | - | 380 |
| - Terminated Nonvested | (120) | - | (120) |
| - Terminated Vested (Lump Sum Cashout) | (175) | - | (175) |
| - Retirement | (34) | 34 | - |
| - Death w/ Beneficiary | (1) | 1 | - |
| - Death w/o Beneficiary | - | (5) | (5) |
| - Net change | 50 | 30 | 80 |
| 3. Participants as of January 1, 1999 | 3,500 | 510 | 4,010 |
| - New Entrants/Rehires | 827 | - | 827 |
| - Terminated Nonvested | (120) | - | (120) |
| - Terminated Vested (Lump Sum Cashout) | (185) | - | (185) |
| - Retirement | (20) | 20 | - |
| - Death w/ Beneficiary | (2) | 2 | - |
| - Death w/o Beneficiary | - | (7) | (7) |
| - Net change | 500 | 15 | 515 |
| 4. Participants as of January 1, 2000 | 4,000 | 525 | 4,525 |

**National Oil Full-Time Salaried Pension Plan
Age/Svc/Earnings as of January 1, 2000**

| Age (Years) | # Participants | Average Salary | Service (Years) | | | | | Totals |
|----------------|----------------|----------------|-----------------|--------|--------|--------|--------|--------|
| | | | < 5 | 5-10 | 10-15 | 15-20 | >20 | |
| < 25 | 201 | 31,250 | 20 | - | - | - | 221 | |
| 25-35 | 238 | 41,500 | 190 | 35 | - | - | 463 | |
| 35-45 | 244 | 50,750 | 280 | 299 | 460 | - | 1,283 | |
| 45-55 | 100 | 54,500 | 100 | 290 | 401 | 511 | 1,402 | |
| 55-65 | 40 | 52,500 | 35 | 80 | 120 | 300 | 575 | |
| > 65 | 7 | 40,500 | 5 | 12 | 12 | 20 | 56 | |
| Totals | 830 | 43,825 | 630 | 716 | 993 | 831 | 4,000 | |
| | Avg Age | | 54,300 | 59,638 | 64,444 | 65,851 | 58,000 | |
| | Avg Svc | 44.6 | | | | | | |
| | Avg Salary | 14.2 | | | | | | |
| | | 58,000 | | | | | | |

National Oil Full-Time Salaried Supplemental Retirement Plan (SRP)

| | |
|---------------------------------------|---|
| Eligibility | Immediate |
| Normal Retirement Age | 65 |
| Early Retirement Age | 55 with 5 years of service |
| Accrued Benefit | Accrued Benefit calculated under the provisions of the Salaried Pension Plan without regard to tax system maximums <u>less</u> actual Accrued Benefit under the Salaried Pension Plan |
| Normal Retirement Benefit | Accrued Benefit |
| Early Retirement Benefit | Accrued Benefit reduced by 0.25% per month that early retirement proceeds age 62 |
| Commencement Date and Form of Benefit | Must be same as under Salaried Pension Plan |
| Indexing | None |
| Termination Benefit | None |
| Pre-Retirement Death Benefit | None |
| Disability Benefit | None |

Supplemental Retirement Plan
Historical Valuation Results - January 1

| | 1997 | 1998 | 1999 | 2000 |
|---|---|--------------|--------------|--------------|
| Participant Summary | | | | |
| 1. Active Participants | | | | |
| (a) count | 34 | 34 | 37 | 39 |
| (b) average age | 50.2 | 50.3 | 50.1 | 49.9 |
| (c) average service | 15.6 | 16.3 | 15.9 | 15.4 |
| (d) average future working lifetime | 7.8 | 7.3 | 7.6 | 7.9 |
| (e) average earnings (prior year) | 275,000 | 279,000 | 284,000 | 286,000 |
| 2. Deferred Vested Participants | | | | |
| (a) count | 0 | 0 | 0 | 0 |
| 3. Pensioners (incl beneficiaries) | | | | |
| (a) count | 7 | 8 | 8 | 10 |
| (b) average age | 70.4 | 69.0 | 70.0 | 66.5 |
| (c) average annual benefit | 13,500 | 12,875 | 12,875 | 11,250 |
| Expense Valuation Results | | | | |
| 1. Reconciliation of funded status at valuation date: | | | | |
| (a) Obligations | | | | |
| (i) accrued benefit obligation | (6,491,319) | (7,025,523) | (9,194,038) | (7,404,044) |
| (ii) projected benefit obligation | (10,113,287) | (11,188,796) | (14,260,382) | (11,943,378) |
| (b) Market Value of Assets | 0 | 0 | 0 | 0 |
| (c) Surplus: (a)(ii) + (b) | (10,113,287) | (11,188,796) | (14,260,382) | (11,943,378) |
| (d) Unrecognized prior service costs | 0 | 0 | 0 | 0 |
| (e) Unrecognized (gain)/loss | (386,713) | (458,783) | 1,318,772 | (2,523,441) |
| (f) Prepaid/(accrued) expense | (10,500,000) | (11,647,578) | (12,941,610) | (14,466,819) |
| 2. Pension Expense | | | | |
| (a) Service cost (beg. of year) | 503,262 | 522,543 | 626,801 | 543,832 |
| (b) Interest cost | 739,816 | 874,488 | 1,001,409 | 994,477 |
| (c) Expected ROA | 0 | 0 | 0 | 0 |
| (d) Prior svc cost recognized | 0 | 0 | 0 | 0 |
| (e) Amort of unrec (gain)/loss | 0 | 0 | 0 | (168,241) |
| (f) Pension Expense for year | 1,243,078 | 1,397,031 | 1,628,210 | 1,370,068 |
| 3. Benefit Payments | 95,500 | 103,000 | 103,000 | 112,500 |
| 4. Actuarial Basis | | | | |
| (a) Discount rate | 7.00% | 7.50% | 6.75% | 8.00% |
| (b) Return on assets | 9.00% | 9.00% | 9.00% | 9.00% |
| (c) Salary scale | 4.50% | 5.00% | 4.25% | 5.00% |
| (d) CPI | 3.50% | 3.50% | 3.50% | 3.50% |
| (e) All other assumptions | Same as for Full-time Salaried Pension Plan | | | |

National Oil Full-Time Hourly Union Pension Plan

| | |
|------------------------------|--|
| Eligibility | Immediate |
| Vesting | 100% after 5 years of service |
| Normal Retirement Age | 65 |
| Early Retirement Age | 55 with 10 years of service |
| Normal Retirement Benefit | <p>\$65 per month times years of service for terminations/retirements during 2000</p> <p><i>Previously negotiated increases in benefit multiplier:</i></p> <ul style="list-style-type: none"> - \$70 per month for terminations/retirements during 2001 - \$75 per month for terminations/retirements during 2002 and beyond |
| Accrued Benefit | Benefit calculated as under the normal retirement benefit formula based on service and multiplier as of date of calculation. |
| Early Retirement Benefit | Unreduced benefit at 62 with 30 years of service, otherwise reduced by 0.25% per month that early retirement precedes Normal Retirement Age. |
| Form of Benefit | <p>If married, 50% joint & survivor benefit without reduction</p> <p>If not married, single life annuity.</p> |
| Optional Forms of Benefit | None |
| Post-Retirement Indexing | Minimum of 1% or Belair CPI each year after pension commencement |
| Termination Benefit | Lump sum equal to actuarial present value of accrued benefit assuming no indexing |
| Pre-Retirement Death Benefit | Lump sum equal to actuarial present value of accrued benefit assuming no indexing, payable to named beneficiary |
| Disability Benefit | None |

National Oil Full-Time Hourly Union Pension Plan
Historical Actuarial Valuation Results

1997 1998 1999 2000

Participant Summary - January 1

| | | | | |
|--|--------|--------|--------|--------|
| <i>Active Participants</i> | | | | |
| (a) count | 5,225 | 5,350 | 5,480 | 6,200 |
| (b) average age | 43.7 | 43.8 | 44.2 | 44.5 |
| (c) average service | 14.0 | 14.0 | 14.6 | 14.9 |
| (d) average future working lifetime | 12.3 | 12.4 | 12.2 | 12.1 |
| (e) average plan earnings (prior year) | 31,050 | 32,050 | 33,000 | 34,300 |
| <i>Deferred Vested Participants</i> | | | | |
| (a) count | - | - | - | - |
| <i>Pensioners (incl beneficiaries)</i> | | | | |
| (a) count | 725 | 770 | 830 | 880 |
| (b) average age | 67.2 | 67.9 | 68.8 | 69.6 |
| (c) average annual benefit | 9,100 | 9,300 | 9,400 | 9,600 |

Plan Assets

| | | | | |
|---|-------------|-------------|--------------|--------------|
| <i>Change in Plan Assets during Prior Year:</i> | | | | |
| Market Value of Assets at January 1 of prior year | 170,000,000 | 201,927,150 | 203,056,058 | 250,623,920 |
| Employer Contributions during prior year | 12,000,000 | 13,000,000 | 15,000,000 | 14,500,000 |
| Benefit Payments during prior year | (9,210,000) | (9,836,000) | (10,542,000) | (11,548,000) |
| Expenses during prior year | - | - | - | - |
| Investment return during prior year | 29,137,150 | (2,035,092) | 43,109,862 | 40,335,987 |
| Market Value of Assets at January 1 of current year | 201,927,150 | 203,056,058 | 250,623,920 | 293,911,907 |
| Rate of return during prior year | 17% | -1% | 21% | 16% |
| <i>Average Portfolio Mix During Prior Year:</i> | | | | |
| (a) Domestic Large Cap Equities | 27% | 24% | 29% | 28% |
| (b) Domestic Small Cap Equities | 19% | 24% | 15% | 19% |
| (c) Domestic Fixed Income | 40% | 41% | 42% | 43% |
| (d) International Equities | 8% | 5% | 9% | 6% |
| (e) Real Estate | 3% | 3% | 3% | 2% |
| (f) Cash | 3% | 3% | 2% | 2% |
| (g) Total | 100% | 100% | 100% | 100% |
| <i>Asset Class Returns during Prior Year:</i> | | | | |
| (a) Domestic Large Cap Equities | 30% | -3% | 43% | 17% |
| (b) Domestic Small Cap Equities | 9% | -12% | 26% | 32% |
| (c) Domestic Fixed Income | 14% | 5% | 6% | 9% |
| (d) International Equities | 12% | 7% | 21% | 18% |
| (e) Real Estate | 18% | 3% | 3% | 10% |
| (f) Cash | 4% | 3% | 3% | 3% |

National Oil Full-Time Hourly Union Pension Plan
Historical Actuarial Valuation Results

1997 1998 1999 2000

Funding Valuation - January 1

| 1 Actuarial Accrued Liability: | | | | | | | | |
|---|--------------|-----------|-------------|-----------|--|-----------|--------------|-----------|
| <i>Active Multiplier</i> | | | | | | | | |
| | \$ | 58 | \$ | 59 | \$ | 60 | \$ | 65 |
| (a) Active participants | 148,985,897 | | 167,105,106 | | 186,828,275 | | 223,521,020 | |
| (b) Deferred vested participants | - | | - | | - | | - | |
| (c) Pensioners | 67,294,500 | | 71,610,000 | | 76,459,600 | | 81,945,600 | |
| (d) Total | 216,280,397 | | 238,715,106 | | 263,287,875 | | 305,466,620 | |
| 2 Actuarial Value of Assets | 201,927,150 | | 203,056,058 | | 250,623,920 | | 293,911,907 | |
| 3 Unfunded Actuarial Accrued Liability: (1d)-(2) | 14,353,247 | | 35,659,048 | | 12,663,955 | | 11,554,713 | |
| 4 Normal Cost (beg. Of year) | 10,641,850 | | 11,936,079 | | 12,796,457 | | 15,001,411 | |
| 5 Change in Unfunded AAL during prior year: | | | | | | | | |
| (a) Unfunded AAL at prior valuation date | 27,000,000 | | 14,353,247 | | 35,659,048 | | 12,663,955 | |
| (b) Adjustment for Interest | 2,160,000 | | 1,148,260 | | 2,852,724 | | 1,013,116 | |
| (c) Normal Cost w/interest less contributions | (1,000,000) | | (1,506,802) | | (2,109,035) | | (679,826) | |
| (d) (Gain)/Loss on investment | (15,425,550) | | 18,315,828 | | (26,687,057) | | (20,167,994) | |
| (e) (Gain)/Loss on termination | 100,000 | | (500,000) | | (300,000) | | 250,000 | |
| (f) (Gain)/Loss on salary increases less than expected | - | | - | | - | | - | |
| (g) (Gain)/Loss on mortality | 175,000 | | 100,000 | | (300,000) | | 150,000 | |
| (h) (Gain)/Loss on retirement | 800,000 | | 300,000 | | 225,000 | | (200,000) | |
| (i) (Gain)/Loss on expenses | - | | - | | - | | - | |
| (j) (Gain)/Loss on all other factors | 543,797 | | 616,226 | | 209,471 | | 1,331,537 | |
| (k) Change in active benefit multiplier | - | | 2,832,290 | | 3,113,805 | | 17,193,925 | |
| (l) Unfunded AAL at current valuation date | 14,353,247 | | 35,659,048 | | 12,663,955 | | 11,554,713 | |
| 6 Actuarial Basis | | | | | | | | |
| (a) Interest | 8.00% | | 8.00% | | 8.00% | | 8.00% | |
| (b) Salary scale | | | | | N/A | | | |
| (c) Consumer Price Index | 3.50% | | 3.50% | | 3.50% | | 3.50% | |
| (d) Mortality | | | | | GAM83 | | | |
| (e) Turnover | | | | | Based on NOC experience for 1986-1988 | | | |
| (f) Retirement age | | | | | Age 62 | | | |
| (g) Proportion married and age difference | | | | | 80% married, husbands 3 years older than wives | | | |
| (h) Expenses | | | | | Assume all expenses paid by company | | | |
| (i) Asset Valuation Method | | | | | Market value of assets | | | |
| (j) Actuarial Cost Method | | | | | Unit credit | | | |

National Oil Full-Time Hourly Union Pension Plan
Historical Actuarial Valuation Results

1997 1998 1999 2000

Expense Valuation - January 1

| <i>1. Reconciliation of funded status at valuation date:</i> | | | | |
|--|---------------|--|---------------|---------------|
| | \$ | \$ | \$ | \$ |
| | 60 | 60 | 60 | 75 |
| (a) Obligations: (active multiplier) | | | | |
| (i) accrued benefit obligation | (258,971,960) | (262,121,636) | (319,552,394) | (339,854,469) |
| (ii) projected benefit obligation | (258,971,960) | (262,121,636) | (319,552,394) | (339,854,469) |
| (b) Market Value of Assets | 201,927,150 | 203,056,058 | 250,623,920 | 293,911,907 |
| (c) Surplus: (a)(ii) + (b) | (57,044,810) | (59,065,578) | (68,928,474) | (45,942,562) |
| (d) Prior Service Cost to be recognized | - | - | - | 51,581,774 |
| (e) Unrecognized (gains)/losses | 53,044,810 | 52,261,449 | 59,887,109 | (18,025,077) |
| (f) Prepaid/(Accrued) expenses | (4,000,000) | (6,804,128) | (9,041,365) | (12,385,866) |
| <i>2. Pension Expense:</i> | | | | |
| (a) Service Cost (beg. Of year) | 13,210,572 | 13,352,224 | 15,995,571 | 17,309,320 |
| (b) Interest Cost | 18,730,427 | 20,291,689 | 22,293,695 | 28,111,183 |
| (c) Expected return on assets | (18,343,994) | (18,507,425) | (22,734,263) | (26,719,912) |
| (d) Recognition of prior service cost | - | - | - | 51,581,774 |
| (e) Amortization of unrecognized (gain)/loss | 2,207,123 | 2,100,749 | 2,289,497 | - |
| (f) Pension Expense | 15,804,128 | 17,237,237 | 17,844,500 | 70,282,365 |
| <i>3. Actuarial Basis</i> | | | | |
| (a) Discount rate | 7.00% | 7.50% | 6.75% | 8.00% |
| (b) Return on assets | 9.00% | 9.00% | 9.00% | 9.00% |
| (c) Salary scale | | N/A | | |
| (d) Consumer Price Index | 3.50% | 3.50% | 3.50% | 3.50% |
| (e) Mortality | | GAM83 | | |
| (f) Turnover | | Based on NOC experience for 1986-1988 | | |
| (g) Retirement age | | Age 62 | | |
| (h) Proportion married and age difference | | 80% married, husbands 3 years older than wives | | |
| (i) Expenses | | Assume all expenses paid by company | | |
| (j) Asset Valuation Method | | Market value of assets | | |
| (k) Actuarial Cost Method | | Projected unit credit | | |

**National Oil Full-Time Hourly Union Pension Plan
Reconciliation of Plan Participants (1997-2000)**

| | <u>Active</u> | <u>Pensioners/ Beneficiaries</u> | <u>Total</u> |
|--|---------------|--------------------------------------|--------------|
| 1. Participants as of January 1, 1997 | 5,225 | 725 | 5,950 |
| - New Entrants/Rehires | 550 | - | 550 |
| - Terminated Nonvested | (150) | - | (150) |
| - Terminated Vested (Lump Sum Cashout) | (225) | - | (225) |
| - Retirement | (46) | 46 | - |
| - Death w/ Beneficiary | (4) | 4 | - |
| - Death w/o Beneficiary | - | (5) | (5) |
| - Net change | 125 | 45 | 170 |
| 2. Participants as of January 1, 1998 | 5,350 | 770 | 6,120 |
| - New Entrants/Rehires | 605 | - | 605 |
| - Terminated Nonvested | (175) | - | (175) |
| - Terminated Vested (Lump Sum Cashout) | (240) | - | (240) |
| - Retirement | (55) | 55 | - |
| - Death w/ Beneficiary | (5) | 5 | - |
| - Death w/o Beneficiary | - | - | - |
| - Net change | 130 | 60 | 190 |
| 3. Participants as of January 1, 1999 | 5,480 | 830 | 6,310 |
| - New Entrants/Rehires | 1,100 | - | 1,100 |
| - Terminated Nonvested | (175) | - | (175) |
| - Terminated Vested (Lump Sum Cashout) | (150) | - | (150) |
| - Retirement | (54) | 54 | - |
| - Death w/ Beneficiary | (1) | 1 | - |
| - Death w/o Beneficiary | - | (5) | (5) |
| - Net change | 720 | 50 | 770 |
| 4. Participants as of January 1, 2000 | 6,200 | 880 | 7,080 |

**National Oil Full-Time Hourly Union Pension Plan
Age/Svc/Earnings as of January 1, 2000**

| Age (Years) | # Participants | Average Salary | Service (Years) | | | | | Totals |
|----------------|----------------|----------------|-----------------|--------|--------|--------|--------|--------|
| | | | < 5 | 5-10 | 10-15 | 15-20 | >20 | |
| < 25 | 275 | 22,500 | 35 | - | - | - | 310 | |
| 25-35 | 361 | 24,500 | 201 | 168 | - | - | 730 | |
| 35-45 | 324 | 24,750 | 390 | 522 | 801 | - | 2,037 | |
| 45-55 | 65 | 22,500 | 190 | 422 | 701 | 829 | 2,207 | |
| 55-65 | 32 | 21,650 | 41 | 101 | 201 | 501 | 876 | |
| > 65 | 1 | 18,500 | 4 | 15 | 9 | 11 | 40 | |
| Totals | | | 861 | 1,228 | 1,712 | 1,341 | 6,200 | |
| | Avg Age | | 28,471 | 33,765 | 38,905 | 40,907 | 34,300 | |
| | Avg Svc | 44.5 | | | | | | |
| | Avg Salary | 14.9 | | | | | | |
| | | 34,300 | | | | | | |

National Oil Part-Time DC Pension Plan

| | |
|--------------------------------------|--|
| Eligibility | Immediate |
| Vesting | Immediate |
| Employer Contributions | 90¢ per hour worked |
| Plan Fund | The employer invests the contributions in GIC's. There are no employee investment choices. |
| Account Balance | Contributions are accumulated in member's individual account earning interest at the rate of return earned by the Plan Fund. |
| Loans | Not permitted. |
| Benefit on Termination or Retirement | Account balance is transferred to a PPA for the member after one year from date of termination or retirement, unless employee has since returned to employment with NOC. |
| Benefit on Death | Account balance is payable to named beneficiary |

National Oil Part-Time DC Pension Plan
Historical Results - January 1

1997 1998 1999 2000

Participant Summary

| | | | | |
|---|-------|-------|-------|-------|
| (a) number participating during prior year | 3,985 | 4,112 | 4,685 | 5,114 |
| (b) average age | 31.2 | 31.4 | 30.9 | 29.9 |
| (c) average hours worked in prior year | 1,040 | 1,120 | 1,200 | 1,185 |
| (d) average earnings per hour in prior year | 13.00 | 13.40 | 14.50 | 15.00 |

Plan Assets

| | | | | |
|---|-------------|-------------|-------------|-------------|
| <i>Change in Plan Assets during Prior Year:</i> | | | | |
| Market Value of Assets at January 1 of prior year | 16,773,120 | 19,031,338 | 21,367,242 | 24,347,422 |
| Employer Contributions during prior year | 3,729,960 | 4,144,896 | 5,059,800 | 5,454,081 |
| Benefit Payments during prior year | (2,514,590) | (2,794,323) | (3,411,115) | (3,676,923) |
| Expenses during prior year | - | - | - | - |
| Investment return during prior year | 1,042,848 | 985,331 | 1,331,495 | 1,766,520 |
| Market Value of Assets at January 1 of current year | 19,031,338 | 21,367,242 | 24,347,422 | 27,891,100 |
| Rate of return during prior year | 6% | 5% | 6% | 7% |

National Oil Full-Time Salaried and Union Retiree Health Benefit Program

| | | | |
|-----------------------------|--|-------------|-----------------------|
| Eligibility | Immediate | | |
| Earliest Retirement Age | 55 | | |
| Benefits | Retirees and their spouses may elect to participate in a fully insured group health plan, with the portion of premium paid by the plan as shown below: | | |
| Annual Premium Cost-Sharing | Years of service | | |
| | <u>at Retirement</u> | <u>Plan</u> | <u>Retiree/Spouse</u> |
| | 0 - 4 | 0% | 100% |
| | 5 - 9 | 25% | 75% |
| | 10 - 14 | 50% | 50% |
| | 15 - 19 | 75% | 25% |
| | 20 + | 100% | 0% |

Retiree Health and Welfare Program
Historical Valuation Results

| | 1997 | 1998 | 1999 | 2000 |
|---|---------------|---------------|---------------|---------------|
| Expense Valuation Results - January 1 | | | | |
| 1. Reconciliation of funded status at valuation date: | | | | |
| (a) APBO | | | | |
| (i) actives | (267,323,368) | (260,521,387) | (339,772,152) | (215,887,182) |
| (ii) retirees | (150,925,944) | (159,674,399) | (182,954,236) | (156,332,097) |
| (iii) total | (418,249,312) | (420,195,786) | (522,726,388) | (372,219,279) |
| (b) Market Value of Assets | 0 | 0 | 0 | 0 |
| (c) Surplus: (a) + (b) | (418,249,312) | (420,195,786) | (522,726,388) | (372,219,279) |
| (d) Unrecognized prior service costs | 0 | 0 | 0 | 0 |
| (e) Unrecognized (gain)/loss | (6,750,688) | (41,312,246) | 24,725,003 | (168,738,513) |
| (f) Prepaid/(accrued) expense | (425,000,000) | (461,508,032) | (498,001,384) | (540,957,792) |
| 2. Expense | | | | |
| (a) Service cost (beg. of year) | 18,606,851 | 18,384,226 | 22,439,287 | 17,525,688 |
| (b) Interest cost | 30,151,181 | 32,359,126 | 36,267,121 | 30,519,597 |
| (c) Expected ROA | 0 | 0 | 0 | 0 |
| (d) Prior svc cost recognized | 0 | 0 | 0 | 0 |
| (e) Amort of unrec (gain)/loss | 0 | 0 | 0 | (10,959,715) |
| (f) Expense for year | 48,758,032 | 50,743,352 | 58,706,408 | 37,085,570 |
| 3. Benefit Payments | 12,250,000 | 14,250,000 | 15,750,000 | 16,500,000 |
| 4. Actuarial Basis | | | | |
| (a) Discount rate | 7.00% | 7.50% | 6.75% | 8.00% |
| (b) Return on assets | 9.00% | 9.00% | 9.00% | 9.00% |
| (c) Medical trend | | | | |
| for 1997 | 8.00% | | | |
| for 1998 | 7.50% | 7.50% | | |
| for 1999 | 7.00% | 7.00% | 7.00% | |
| for 2000 | 6.50% | 6.50% | 6.50% | 6.50% |
| ultimate | 4.50% | 4.50% | 4.50% | 4.50% |
| (d) CPI | 3.50% | 3.50% | 3.50% | 3.50% |
| (e) group premium cost | 6,500 | 7,250 | 7,600 | 7,600 |