



Case Study

FALL 2017

Design & Accounting Exam–U.S.
EXAM RETDAU

RETDAU Afternoon

U.S. Exam Case Study - Course DA Retirement

National Oil Company - Background

National Oil Company (NOC) is a large well-established company that services oil wells all over the country of Gevrey. NOC has been in existence for over 30 years and has approximately 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 Gevrey. Although NOC is the largest player in the industry within Gevrey, 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 Gevrey – Background

Gevrey 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
- employer contributions may or may not be dependent on employee contributions
- individuals may contribute up to \$20,000 annually
- such contributions are tax deductible to the individual

The tax assistance available under each of the above two arrangements does not depend on the extent of participation under the other one. For example, an individual could participate in a DC ERP and, if eligible under the plans' rules, also a DB 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 Gevrey 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 payable as an indemnity for health related services are not taxable to plan participants at any time.

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

For financial reporting purposes, Gevrey adopted GAAP Accounting Standards.

The investment market in Gevrey 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 ERP for its full-time salaried employees;
2. a unit benefit defined benefit 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, eligible 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	Base pay, excluding overtime and bonuses
Normal Retirement Benefit	2% of best average earnings times years of service, subject to tax system maximum 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

2016

2017

Participant Summary - January 1

Active Participants

(a) count	3,550	3,280
(b) average age	48.5	49.0
(c) average service	18.5	19.0
(d) average future working lifetime	10.5	10.2
(e) average future working lifetime to vesting (for those not)	3.0	3.0
(f) average plan earnings (prior year)	86,900	89,800

Deferred Vested Participants

(a) count	-	-
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Pensioners (incl beneficiaries)

(a) count	997	1,080
(b) average age	67.8	67.3
(c) average annual benefit	22,750	23,000

Duration of plan liabilities	14.4	15.0
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Plan Assets (numbers in \$000's) *

Change in Plan Assets during Prior Year:

Market Value of Assets at January 1 of prior year	1,252,276	1,344,520
Employer Contributions during prior year	42,391	41,182
Benefit Payments during prior year	(21,000)	(22,700)
Expenses during prior year	-	-
Investment return during prior year	70,853	80,549
Market Value of Assets at January 1 of current year	1,344,520	1,443,551
Rate of return during prior year	5.61%	5.95%

Average Portfolio Mix During Prior Year:

(a) Domestic Large Cap Equities	30%	32%
(b) Domestic Small Cap Equities	21%	22%
(c) Domestic Fixed Income	35%	34%
(d) International Equities	5%	4%
(e) Real Estate	4%	3%
(f) Cash	5%	5%
(g) Total	100%	100%

Duration of Domestic Fixed Income	10.0	10.0
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Asset Class Returns during Prior Year:

(a) Domestic Large Cap Equities	15%	7%
(b) Domestic Small Cap Equities	18%	8%
(c) Domestic Fixed Income	-9%	6%
(d) International Equities	7%	-5%
(e) Real Estate	2%	2%
(f) Cash	1%	1%

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

	2016	2017
Expense Valuation - January 1 (numbers in \$000's) *		
1. Funded Status and Deferred Costs:		
(a) Accumulated Benefit Obligation	(928,449)	(1,034,173)
(b) Projected Benefit Obligation		
(i) Vested	(1,151,276)	(1,282,375)
(ii) Non-vested	(86,655)	(96,523)
(iii) Total	(1,237,931)	(1,378,898)
(c) Fair Value of Assets	1,344,520	1,443,551
(d) Funded Status: (b) + (c)	106,589	64,653
(e) Unrecognized (gains)/losses	(265,733)	(203,656)
2. Net Periodic Benefit Cost		
(a) Service Cost (beg. of year)	57,342	64,067
(b) Interest Cost	64,196	57,223
(c) Expected return on assets	(87,994)	(94,325)
(d) Amortization of prior service cost	-	-
(e) Amortization of actuarial (gain)/loss	(12,503)	(5,814)
(f) Total Net Periodic Benefit Cost	21,041	21,151
All plan administrative expenses are paid and accounted for outside of the plan fund		
3. Actuarial Basis and Supplemental Data		
(a) Discount rate	5.00%	4.00%
(b) Return on assets	6.50%	6.50%
(c) Salary scale	3.50%	3.50%
(d) Consumer Price Index	3.00%	3.00%
(e) Mortality	GAM83	
(f) Turnover	Based on NOC experience for 2000-2005	
(g) Proportion married and age difference	80% married; male spouses 3 years older than female spouses	
(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	
(l) Expected Employer contributions	41,182	40,002
(m) Expected Benefit payments	(22,700)	(24,800)
* numbers may not add due to rounding		

**National Oil Full-Time Salaried Pension Plan
Reconciliation of Plan Participants**

	<u>Active</u>	<u>Pensioners/ Beneficiaries</u>	<u>Total</u>
Participants as of January 1, 2016	3,550	997	4,547
- New Entrants/Rehires	45	-	45
- Terminated Nonvested	(30)	-	(30)
- Terminated Vested (Lump Sum Cashout)	(200)	-	(200)
- Retirement	(80)	80	-
- Death w/ Beneficiary	(3)	3	-
- Death w/o Beneficiary	(2)	-	(2)
- Net change	(270)	83	(187)
Participants as of January 1, 2017	3,280	1,080	4,360

**National Oil Full-Time Salaried Pension Plan
Age/Svc/Earnings as of January 1, 2017**

Age (Years)	# Participants	Average Salary	Service (Years)					Totals
			< 5	5-10	10-15	15-20	>20	
< 25	20	60,000	20	65,000	-	-	-	40
25-35	100	70,000	40	75,000	110	110	-	360
35-45	70	80,000	60	85,000	200	100	150	580
45-55	80	80,000	50	90,000	150	300	720	1,300
55-65	10	80,000	60	85,000	80	220	560	930
> 65	-	-	-	-	50	20	-	70
Totals	280	75,000	230	82,600	590	750	1,430	3,280
					86,900	88,800	95,600	89,800

Avg Age 49.0
Avg Svc 19.0
Avg Salary 89,800

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 precedes 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

2016

2017

Participant Summary

1. Active Participants		
(a) count	53	50
(b) average age	56.5	57.0
(c) average service	20.8	21.0
(d) average future working lifetime	5.0	4.8
(e) average future working lifetime to vesting (for those not)	2.0	2.0
(f) average plan earnings (prior year)	430,000	450,000
2. Deferred Vested Participants		
(a) count	-	-
3. Pensioners (incl beneficiaries)		
(a) count	32	35
(b) average age	67.0	66.8
(c) average annual benefit	16,600	16,800
Duration of plan liabilities	15.0	15.5

Expense Valuation Results (numbers in \$000's) *

1. Funded Status and Deferred Costs:		
(a) Accumulated Benefit Obligation	(62,259)	(73,441)
(b) Projected Benefit Obligation		
(i) Vested	(54,934)	(64,801)
(ii) Non-vested	(18,311)	(21,600)
(iii) Total	(73,245)	(86,401)
(c) Fair Value of Assets	-	-
(d) Funded Status: (b) + (c)	(73,245)	(86,401)
(e) Unrecognized (gains)/losses	13,563	20,714
2. Net Periodic Benefit Cost		
(a) Service cost (beg. of year)	1,739	1,901
(b) Interest Cost	3,549	3,520
(c) Expected ROA	-	-
(d) Amort of prior service cost	-	-
(e) Amort of unrec (gains)/losses	1,248	2,515
(f) Total Net Periodic Benefit Cost	6,535	7,937
All plan administrative expenses are paid out of general assets of NOC (outside of plan accounting).		
3. Expected Benefit Payments	531	588
4. Actuarial Basis		
(a) Discount rate	4.75%	4.00%
(b) Return on assets	N/A	N/A
(c) Salary scale	3.50%	3.50%
(d) CPI	3.00%	3.00%
(e) All other assumptions	Same as for Full-time Salaried Pension Plan	

* numbers may not add due to rounding

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	\$80 per month times years of service for terminations/ retirements prior to 2010 \$81 per month times years of service for terminations/ retirements during 2010 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	If married, 50% joint & survivor benefit without reduction If not married, single life annuity.
Optional Forms of Benefit	None
Post-Retirement Indexing	Lesser of 1% or 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

2016

2017

Participant Summary - January 1		
<i>Active Participants</i>		
(a) count	6,135	5,930
(b) average age	50.0	50.0
(c) average service	21.0	20.5
(d) average future working lifetime	10.0	9.8
(e) average future working lifetime to vesting (for those not)	3.3	3.0
(f) average plan earnings (prior year)	46,600	49,000
<i>Deferred Vested Participants</i>		
(a) count	-	-
<i>Pensioners (incl beneficiaries)</i>		
(a) count	1,237	1,299
(b) average age	72.0	71.0
(c) average annual benefit	11,500	11,750
Duration of plan liabilities	14.1	15.0

Plan Assets (numbers in \$000's) *

<i>Change in Plan Assets during Prior Year:</i>		
Market Value of Assets at January 1 of prior year	946,028	900,101
Employer Contributions during prior year	40,000	50,000
Benefit Payments during prior year	(14,000)	(14,000)
Expenses during prior year	-	-
Investment return during prior year	(71,927)	54,352
Market Value of Assets at January 1 of current year	900,101	990,452
Rate of return during prior year	-7.50%	5.92%
<i>Average Portfolio Mix During Prior Year:</i>		
(a) Domestic Large Cap Equities	5%	7%
(b) Domestic Small Cap Equities	0%	0%
(c) Domestic Fixed Income	92%	90%
(d) International Equities	0%	0%
(e) Real Estate	0%	0%
(f) Cash	3%	3%
(g) Total	100%	100%
Duration of Domestic Fixed Income	15.0	15.0
<i>Asset Class Returns during Prior Year:</i>		
(a) Domestic Large Cap Equities	15%	7%
(b) Domestic Small Cap Equities	18%	8%
(c) Domestic Fixed Income	-9%	6%
(d) International Equities	7%	-5%
(e) Real Estate	2%	2%
(f) Cash	1%	1%

* numbers may not add due to rounding

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

	2016	2017
1. Funded Status and Deferred Costs:		
(active multiplier)	81.00	81.00
(a) Accumulated Benefit Obligation	(912,112)	(996,997)
(b) Projected Benefit Obligation		
(i) Vested	(866,506)	(947,147)
(ii) Non-vested	(45,606)	(49,850)
(iii) Total	(912,112)	(996,997)
(c) Fair Value of Assets	900,101	990,452
(d) Funded Status: (b) + (c)	(12,011)	(6,545)
(e) Unrecognized prior service costs	5,335	4,488
(f) Unrecognized (gains)/losses	(60,506)	(51,000)
2. Net Periodic Benefit Cost		
(a) Service Cost (beg. of year)	36,055	41,124
(b) Interest Cost	51,764	46,378
(c) Expected return on assets	(52,791)	(57,957)
(d) Amortization of prior service cost	847	847
(e) Amortization of actuarial (gain)/loss	-	-
(f) Immediate recognition of past service costs & (gains)/losses	-	-
(g) Total Net Periodic Benefit Cost	35,876	30,391
All plan administrative expenses are paid and accounted for outside of the plan fund.		
3. Actuarial Basis and Supplemental Data		
(a) Discount rate	5.50%	4.50%
(b) Return on assets	5.75%	5.75%
(c) Salary scale	N/A	N/A
(d) Consumer Price Index	3.00%	3.00%
(e) Mortality	GAM83	
(f) Turnover	Based on NOC experience for 2000-2005	
(g) Retirement age	Age 62, with appropriate early retirement reduction, if any	
(h) Proportion married and age difference	80% married, male spouses 3 years older than female spouses	
(i) Expenses	Assume all expenses paid by company	
(j) Post-retirement indexing	1.00%	1.00%
(k) Asset Valuation Method	Market value of assets	
(l) Actuarial Cost Method	Projected unit credit	
(m) Expected Employer contributions	50,000	50,000
(n) Expected Benefit payments	(14,000)	(15,000)

* numbers may not add due to rounding

**National Oil Full-Time Hourly Union Pension Plan
Reconciliation of Plan Participants**

	<u>Active</u>	<u>Pensioners/ Beneficiaries</u>	<u>Total</u>
Participants as of January 1, 2016	6,135	1,237	7,372
- New Entrants/Rehires	10	-	10
- Terminated Nonvested	(70)	-	(70)
- Terminated Vested (Lump Sum Cashout)	(80)	-	(80)
- Retirement	(60)	60	-
- Death w/ Beneficiary	(2)	2	-
- Death w/o Beneficiary	(3)	-	(3)
- Net change	(205)	62	(143)
Participants as of January 1, 2017	5,930	1,299	7,229

**National Oil Full-Time Hourly Union Pension Plan
Age/Svc/Earnings as of January 1, 2017**

Age (Years)	# Participants	Average Salary	Service (Years)					Totals
			< 5	5-10	10-15	15-20	>20	
< 25	50	35,000	50	40,000	-	-	-	100
25-35	100	30,000	40	40,000	100	-	-	240
35-45	50	30,000	130	35,000	100	700	700	1,680
45-55	50	40,000	50	45,000	100	50,000	45,000	45,900
55-65	50	35,000	50	36,000	100	200	1,200	1,600
> 65	-	-	10	30,000	100	100	200	410
Totals	300	33,300	330	37,900	500	1,400	3,400	5,930
					43,000	49,300	52,200	49,000
	Avg Age	50.0						
	Avg Svc	20.5						
	Avg Salary	49,000						

National Oil Part-Time DC Pension Plan

Eligibility	Immediate
Vesting	Immediate
Employee Contributions	Employee may defer between 1% to 20% of pay
Employer Contributions	3% of pay
Plan Fund Investment Options	The employer invests in funds elected by employee
Account Balance	Contributions are accumulated in member's individual account earning a rate of return based on the investments elected by the employee
Loans/Withdrawals	Not permitted.
Benefit on Termination or Retirement	Account balance is payable to employee upon termination or retirement. Employee has the option to leave the balance in the fund or withdraw entire balance immediately upon termination or retirement.
Benefit on Death	Account balance is payable to named beneficiary

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

2016 **2017**

Participant Summary

(a) number participating during prior year	6,900	7,100
(b) average age	27.0	29.0
(c) average pay	37,000	39,000

Plan Assets (numbers in \$000's) *

<i>Change in Plan Assets during Prior Year:</i>		
Market Value of Assets at January 1 of prior year	97,573	109,540
Employee Contributions during prior year	12,765	13,845
Company Contributions during prior year	7,659	8,307
Benefit Payments during prior year	(14,490)	(14,910)
Expenses during prior year	-	-
Investment return during prior year	6,032	5,658
Market Value of Assets at January 1 of current year	109,540	122,440
Rate of return during prior year	6.00%	5.00%

* numbers may not add due to rounding

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

Eligibility	Immediate
Earliest Retirement Age	55 and 10 years of service
Retirement benefit	Retirees and their spouses may elect to participate in a self insured health plan, with 100% the of cost of the plan paid by the employer.
Pre-retirement / termination benefits	None
Spousal Coverage	Coverage continues for the life of the spouse after death of an eligible employee
Benefits Covered	\$0 deductible; \$0 copay No lifetime maximum Office visits Hospital visits Surgery Prescription drugs
Life Insurance benefit	Effective January 1, 2010: introduced \$50,000 life insurance benefit payable upon death after retirement

Retiree Health and Welfare Program
 Historical Valuation Results

2016

2017

Expense Valuation Results - January 1 (numbers in \$000's) *

1. Funded Status and Deferred Costs:		
(a) Accumulated Postretirement Benefit Obligation		
(i) actives - fully vested	(1,031,105)	(1,218,466)
(ii) actives - not fully vested	(441,902)	(522,200)
(iii) retirees	(1,102,404)	(1,387,852)
(iv) total	(2,575,411)	(3,128,517)
(b) Fair Value of Assets	0	0
(c) Surplus: (a) + (b)	(2,575,411)	(3,128,517)
(d) Unrecognized prior service costs	9,272	6,590
(e) Unrecognized (gains)/losses	409,001	782,724
2. Net Periodic Benefit Cost		
(a) Service cost (beg. of year)	92,063	108,792
(b) Interest Cost	125,446	120,274
(c) Expected ROA	0	0
(d) Amort of prior service cost	2,682	2,682
(e) Amort of (gain)/loss	14,873	47,259
(f) Total Net Periodic Benefit Cost	235,065	279,007
All plan administrative and claims expenses are included in the claims costs used to determine the plan liability.		
3. Expected Benefit Payments	53,000	60,000
4. Average Future Working Lifetime to Retirement	10.18	9.94
5. Average Future Working Lifetime to FEA	7.18	6.94
6. Average Future Working Lifetime to Fully Vested (for those not vested)	7.18	6.94
7. Duration of plan liabilities	12.00	13.00
8. Actuarial Assumptions:		
(a) Discount rate	4.75%	3.75%
(b) Return on assets	N/A	N/A
(c) Medical trend		
Initial rate	5.50%	6.00%
Annual decrease	0.50%	0.50%
Ultimate rate	4.50%	4.50%
Year ultimate trend rate reached	2018	2020
(d) CPI	3.00%	3.00%
(e) Per capita claims cost	16,500	18,000
(f) Retirement assumption	Age 62 with 10 years of service	
(g) All other demographic assumptions	Same as those used for pension plans	

* numbers may not add due to rounding