

FALL 2015

EXAM RETFRC

**Retirement Funding &
Regulation Exam – Canada**

CASE STUDY

RETFRC morning

Case Study - Course FR Retirement - Canada

National Oil Company - Background

National Oil Company (NOC) is a large well-established company that services oil wells all over Canada. Most of NOC's employees are reporting to work in the province of Ontario. NOC has been in existence for over 30 years and has more than 10,000 full-time salaried and union hourly employees and over 6,000 part-time employees. 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 Canada. Although NOC is the largest player in the industry within Canada, 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.

Canadian legislation and social programs will apply to NOC in this case study.

Summary of National Oil's Retirement Benefits

NOC maintains three retirement programs, all registered in Ontario:

1. a final-average pay defined benefit (DB) RPP for its full-time salaried employees;
2. a flat dollar DB RPP for its full-time hourly union staff; and
3. a defined contribution (DC) RPP for its part-time workforce.

Extracts of Retirement Benefits Provisions and Financial Information

National Oil Full-Time Salaried Pension Plan

Eligibility	Immediate
Vesting	Immediate, effective July 1, 2012
Normal Retirement Age	65
Early Retirement Age	55
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 legislative 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 for actives participants and actuarial equivalent for terminated participants
Form of Benefit	If with spouse, 60% joint & survivor benefit, without reduction. If without spouse, single life annuity
Optional Forms of Benefit	None
Indexing	None
Termination Benefit	(1) Lump sum value equal to actuarial present value of accrued pension payable at age 65; or (2) Deferred pension
Pre-Retirement Death Benefit	Lump sum value equal to actuarial present value of accrued pension payable at age 65 to named beneficiary
Disability Benefit	Accrual of service while on long term disability and immediate pension without a reduction upon permanent and total disability

**National Oil Full-Time Salaried Pension Plan
Reconciliation of Plan Participants (2012 - 2015)**

	<u>Active</u>	<u>Pensioners/ Beneficiaries</u>	<u>Total</u>
1. Participants as of January 1, 2012	4,046	821	4,867
- New Entrants/Rehires	200	-	200
- Terminated Nonvested	(80)	-	(80)
- Terminated Vested (Lump Sum Cashout)	(90)	-	(90)
- Retirement	(40)	40	-
- Death w/ Beneficiary	(4)	4	-
- Death w/o Beneficiary	-	(14)	(14)
- Net change	(14)	30	16
2. Participants as of January 1, 2013	4,032	851	4,883
- New Entrants/Rehires	150	-	150
- Terminated (Lump Sum Cashout)	(100)	-	(100)
- Retirement	(50)	50	-
- Death w/ Beneficiary	(5)	5	-
- Death w/o Beneficiary	-	(14)	(14)
- Net change	(5)	41	36
3. Participants as of January 1, 2014	4,027	892	4,919
- New Entrants/Rehires	140	-	140
- Terminated (Lump Sum Cashout)	(90)	-	(90)
- Retirement	(60)	60	-
- Death w/ Beneficiary	(3)	3	-
- Death w/o Beneficiary	(2)	(22)	(24)
- Net change	(15)	41	26
4 Participants as of January 1, 2015	4,012	933	4,945

National Oil Full-Time Salaried Pension Plan
Age/Svc/Earnings as of January 1, 2015

		Service (Years)					Totals	
		< 5	5-10	10-15	15-20	>20		
Age (Years)	< 25	# Participants	180	70	-	-	-	250
	Average Salary	37,800	49,000	-	-	-	40,900	
25-35	# Participants	260	140	80	10	-	490	
	Average Salary	48,900	60,600	69,000	71,500	-	56,000	
35-45	# Participants	190	190	200	190	90	860	
	Average Salary	62,100	70,500	77,800	84,000	85,100	74,900	
45-55	# Participants	150	180	160	320	630	1,440	
	Average Salary	67,300	68,900	78,300	82,000	83,000	78,900	
55-65	# Participants	150	100	100	120	460	930	
	Average Salary	65,100	70,100	75,000	81,100	83,000	77,600	
> 65	# Participants	2	15	10	5	10	42	
	Average Salary	59,000	64,000	69,000	71,000	79,000	69,400	
Totals	# Participants	932	695	550	645	1,190	4,012	
	Average Salary	55,000	65,700	76,000	82,200	83,100	72,500	

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

2012 2013 2014 2015

Participant Summary - January 1

<i>Active Participants</i>				
(a) count	4,046	4,032	4,027	4,012
(b) average age	45.1	46.0	45.9	46.2
(c) average service	15.0	14.7	14.7	14.8
(d) average future working lifetime	11.0	11.0	12.0	12.0
(e) average plan earnings (prior year)	68,000	69,500	71,600	72,500
<i>Deferred Vested Participants</i>				
(a) count	-	-	-	-
<i>Pensioners (incl beneficiaries)</i>				
(a) count	821	851	892	933
(b) average age	67.0	67.7	68.0	68.6
(c) average annual benefit	22,500	22,800	23,100	25,500

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	748,481	832,957	968,997	1,188,326
Employer Contributions during prior year	99,000	100,000	120,000	60,000
Benefit Payments during prior year	(22,000)	(22,200)	(22,400)	(29,700)
Expenses during prior year	-	-	-	-
Investment return during prior year	7,476	58,240	121,729	91,946
Market Value of Assets at January 1 of current year	832,957	968,997	1,188,326	1,310,572
Rate of return during prior year	1.0%	6.7%	12.0%	7.6%
<i>Average Portfolio Mix During Prior Year:</i>				
(a) Domestic Large Cap Equities	30%	32%	32%	32%
(b) Domestic Small Cap Equities	10%	8%	8%	8%
(c) Domestic Fixed Income	40%	40%	40%	40%
(d) International Equities	15%	16%	16%	16%
(e) Real Estate	0%	0%	0%	0%
(f) Cash	5%	4%	4%	4%
(g) Total	100%	100%	100%	100%
<i>Asset Class Returns during Prior Year:</i>				
(a) Domestic Large Cap Equities	-9%	7%	13%	11%
(b) Domestic Small Cap Equities	-5%	7%	38%	-2%
(c) Domestic Fixed Income	14%	4%	-1%	9%
(d) International Equities	-10%	14%	32%	4%
(e) Real Estate	3%	8%	8%	10%
(f) Cash	1%	1%	1%	1%

* numbers may not add due to rounding

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

	2012	2013	2014	2015	2015 Interest Rate Sensitivity
Going Concern Valuation - January 1 (numbers in \$000's) *					
1. Actuarial Accrued Liability:					
(a) Active participants	756,002	915,409	861,242	946,339	1,226,445
(b) Deferred vested participants	-	-	-	-	-
(c) Pensioners	229,059	252,236	261,334	320,281	353,066
(d) Total	985,061	1,167,645	1,122,576	1,266,620	1,579,510
2. Actuarial Value of Assets	832,957	968,997	1,188,326	1,310,572	1,310,572
3. Unfunded Actuarial Accrued Liability: (1d)-(2)	152,104	198,648	(65,750)	(43,951)	268,939
4. Normal Cost (beg. Of year)	50,400	62,273	58,588	63,942	82,868
5. Change in Unfunded AAL during prior year:					
(a) Unfunded AAL at prior valuation date	238,948	152,104	198,648	(65,750)	
(b) Adjustment for Interest	14,337	9,126	10,926	(3,781)	
(c) Normal Cost w/interest less contributions	(48,519)	(49,576)	(57,602)	232	
(d) (Gain)/Loss on investment	39,743	(5,929)	(65,750)	(22,746)	
(e) (Gain)/Loss on termination	(25,000)	5,000	3,000	(5,300)	
(f) (Gain)/Loss on salary increases less than expected	(30,000)	(14,000)	(7,000)	(19,200)	
(g) (Gain)/Loss on mortality	2,000	(3,000)	(2,000)	2,400	
(h) (Gain)/Loss on retirement	(5,000)	4,000	(4,000)	(8,900)	
(i) (Gain)/Loss on assumption changes	-	104,000	(141,100)	80,039	
(j) (Gain)/Loss on expenses	-	-	-	-	
(k) (Gain)/Loss on all other factors	(34,404)	(3,078)	(872)	(945)	
(l) Unfunded AAL at current valuation date	152,104	198,648	(65,750)	(43,951)	
6. Actuarial Basis					
(a) Interest	6.00%	5.50%	5.75%	5.75%	4.75%
(b) Salary scale	4.00%	4.00%	3.50%	3.50%	3.50%
(c) Consumer Price Index	2.50%	2.50%	2.50%	2.50%	2.50%
(d) Mortality	1994 Uninsured Pensioner Mortality - Generational	1994 Uninsured Pensioner Mortality - Generational	1994 Uninsured Pensioner Mortality - Generational	CPM 2014 Private - Generational with scale CPM B	CPM 2014 Private - Generational with scale CPM B
(e) Turnover	Based on NOC experience for 1996-2006				
(f) Retirement age	Age 62				
(g) Proportion married and age difference	80% married; male spouses are 3 years older				
(h) Expenses	Assume all expenses paid by company				
(i) Asset Valuation Method	Market value of assets				
(j) Actuarial Cost Method	Projected unit credit				

* numbers may not add due to rounding

National Oil Full-Time Salaried Pension Plan
Solvency Valuation Results

	2013	2014	2015	2015 Interest Rate Sensitivity
Solvency Valuation - January 1 (numbers in \$000's) *				
1. Actuarial Accrued Liability:				
(a) Active participants	941,068	814,809	1,030,369	1,174,621
(b) Deferred vested participants	-	-	-	-
(c) Pensioners	316,266	308,133	410,458	458,482
(d) Total	1,257,334	1,122,942	1,440,827	1,633,103
2. Market Value of Assets	968,997	1,188,326	1,310,572	1,310,572
3. Solvency Deficiency: (1d)-(2)	288,337	(65,384)	130,255	322,531
4. Actuarial Basis				
(a) Interest - Benefit paid by lump sum	2.5% for 10 years 3.7% thereafter	3.1% for 10 years 4.6% thereafter	2.4% for 10 years 3.7% thereafter	1.4% for 10 years 2.7% thereafter
(a) Interest - Benefit settled by annuity purchase	3.0%	3.9%	2.6%	1.6%
(b) Mortality	UP 1994 - Generational	UP 1994 - Generational	UP 1994 - Generational	UP 1994 - Generational
(c) Retirement age	The age that produces the largest value			
(d) Proportion married and age difference	80% married; male spouses are 3 years older			
(e) Asset Valuation Method	Market value of assets			
(f) Actuarial Cost Method	Unit Credit			

* numbers may not add due to rounding

National Oil Full-Time Hourly Union Pension Plan

Eligibility	Immediate
Vesting	Immediate, effective July 1, 2012
Normal Retirement Age	65
Early Retirement Age	55
Normal Retirement Benefit	\$80 per month times all years of service for terminations/retirements after 2004
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 for active participants and actuarial equivalent for terminated participants
Form of Benefit	With a spouse, 60% joint & survivor benefit without reduction Without a spouse, single life annuity.
Optional Forms of Benefit	None
Bridge Benefit	\$20 per month times all years of service for retirements after 2014. The bridge benefit is payable starting from the latest of age 55 and 85 points and ceasing at age 65
Post-Retirement Indexing	Lesser of 1% or CPI each year after pension commencement
Termination Benefit	(1) Lump sum value equal to actuarial present value of accrued pension payable at age 65; or (2) Deferred pension
Pre-Retirement Death Benefit	Lump sum value equal to actuarial present value of accrued pension payable at age 65 to named beneficiary
Disability Benefit	None

**National Oil Full-Time Hourly Union Pension Plan
Reconciliation of Plan Participants (2012 - 2015)**

	<u>Active</u>	<u>Pensioners/ Beneficiaries</u>	<u>Total</u>
1. Participants as of January 1, 2012	6,285	1,150	7,435
- New Entrants/Rehires	250	-	250
- Terminated Nonvested	(40)	-	(40)
- Terminated Vested (Lump Sum Cashout)	(120)	-	(120)
- Retirement	(70)	70	-
- Death w/ Beneficiary	(5)	5	-
- Death w/o Beneficiary	-	(35)	(35)
- Net change	15	40	55
2. Participants as of January 1, 2013	6,300	1,190	7,490
- New Entrants/Rehires	300	-	300
- Terminated Vested (Lump Sum Cashout)	(200)	-	(200)
- Retirement	(80)	80	-
- Death w/ Beneficiary	(5)	5	-
- Death w/o Beneficiary	-	(50)	(50)
- Net change	15	35	50
3. Participants as of January 1, 2014	6,315	1,225	7,540
- New Entrants/Rehires	250	-	250
- Terminated Vested (Lump Sum Cashout)	(175)	-	(175)
- Retirement	(90)	90	-
- Death w/ Beneficiary	(10)	10	-
- Death w/o Beneficiary	-	(45)	(45)
- Net change	(25)	55	30
4. Participants as of January 1, 2015	6,290	1,280	7,570

**National Oil Full-Time Hourly Union Pension Plan
Age/Svc/Earnings as of January 1, 2015**

		Service (Years)					Totals	
		< 5	5-10	10-15	15-20	>20		
Age (Years)	< 25	# Participants	240	50	-	-	-	290
		Average Salary	42,900	48,500	-	-	-	43,900
25-35	# Participants	320	80	70	5	-	475	
	Average Salary	44,300	49,800	54,400	57,600	-	46,900	
35-45	# Participants	280	320	340	600	390	1,930	
	Average Salary	53,300	50,400	57,900	60,200	60,900	57,300	
45-55	# Participants	140	220	320	640	950	2,270	
	Average Salary	53,200	53,600	60,700	61,500	62,600	60,600	
55-65	# Participants	30	90	120	230	760	1,230	
	Average Salary	52,800	54,900	62,800	63,700	66,300	64,300	
> 65	# Participants	5	20	30	30	10	95	
	Average Salary	54,500	56,800	65,000	66,000	67,800	63,300	
Totals	# Participants	1,015	780	880	1,505	2,110	6,290	
	Average Salary	48,000	51,800	59,600	61,400	63,600	58,500	

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

2012 2013 2014 2015

Participant Summary - January 1

<i>Active Participants</i>				
(a) count	6,285	6,300	6,315	6,290
(b) average age	45.8	46.3	46.2	46.8
(c) average service	16.8	16.6	16.6	17.0
(d) average future working lifetime	11.0	10.7	10.9	10.9
(e) average plan earnings (prior year)	54,300	56,500	57,900	58,500
<i>Deferred Vested Participants</i>				
(a) count	-	-	-	-
<i>Pensioners (incl beneficiaries)</i>				
(a) count	1,150	1,190	1,225	1,280
(b) average age	67.0	67.8	68.2	68.8
(c) average annual benefit	13,600	14,200	14,300	14,900

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	606,421	693,567	817,919	995,757
Employer Contributions during prior year	100,000	95,000	95,000	100,000
Benefit Payments during prior year	(19,000)	(19,500)	(19,500)	(25,000)
Expenses during prior year	-	-	-	-
Investment return during prior year	6,146	48,852	102,338	78,941
Market Value of Assets at January 1 of current year	693,567	817,919	995,757	1,149,697
Rate of return during prior year	1.0%	6.7%	12.0%	7.6%
<i>Average Portfolio Mix During Prior Year:</i>				
(a) Domestic Large Cap Equities	30%	32%	32%	32%
(b) Domestic Small Cap Equities	10%	8%	8%	8%
(c) Domestic Fixed Income	40%	40%	40%	40%
(d) International Equities	15%	16%	16%	16%
(e) Real Estate	0%	0%	0%	0%
(f) Cash	5%	4%	4%	4%
(g) Total	100%	100%	100%	100%
<i>Asset Class Returns during Prior Year:</i>				
(a) Domestic Large Cap Equities	-9%	7%	13%	11%
(b) Domestic Small Cap Equities	-5%	7%	38%	-2%
(c) Domestic Fixed Income	14%	4%	-1%	9%
(d) International Equities	-10%	14%	32%	4%
(e) Real Estate	3%	8%	8%	10%
(f) Cash	1%	1%	1%	1%

* numbers may not add due to rounding

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

	2012	2013	2014	2015	2015 Interest Rate Sensitivity
Going Concern Valuation - January 1 (numbers in \$000's) *					
1. Actuarial Accrued Liability:					
Active Multiplier	\$ 80	\$ 80	\$ 80	\$ 80	\$ 80
(a) Active participants	574,865	688,339	730,256	859,362	1,073,352
(b) Deferred vested participants	-	-	-	-	-
(c) Pensioners	193,936	221,364	233,282	269,585	297,180
(d) Total	768,801	909,703	963,538	1,128,947	1,370,532
2. Actuarial Value of Assets	693,567	817,919	995,757	1,149,697	1,149,697
3. Unfunded Actuarial Accrued Liability: (1d)-(2)	75,235	91,784	(32,218)	(20,751)	220,834
4. Normal Cost (beg. Of year)	34,218	41,466	43,991	50,551	63,138
5. Change in Unfunded AAL during prior year:					
(a) Unfunded AAL at prior valuation date	163,279	75,235	91,784	(32,218)	
(b) Adjustment for Interest	9,797	4,514	5,048	(1,853)	
(c) Normal Cost w/interest less contributions	(67,022)	(61,579)	(53,866)	(59,025)	
(d) (Gain)/Loss on investment	32,670	(4,973)	(55,276)	(19,529)	
(e) (Gain)/Loss on termination	8,000	7,000	(6,000)	900	
(f) (Gain)/Loss on plan amendment	-	-	-	31,542	
(g) (Gain)/Loss on mortality	(21,000)	(9,000)	(5,000)	(3,200)	
(h) (Gain)/Loss on retirement	(26,000)	(6,000)	(9,000)	(7,300)	
(i) (Gain)/Loss on assumption changes	-	80,000	500	69,416	
(j) (Gain)/Loss on expenses	-	-	-	-	
(k) (Gain)/Loss on all other factors	(24,489)	6,587	(409)	515	
(l) Change in active benefit multiplier	-	-	-	-	
(m) Unfunded AAL at current valuation date	75,235	91,784	(32,218)	(20,751)	
6. Actuarial Basis					
(a) Interest	6.00%	5.50%	5.75%	5.75%	4.75%
(b) Salary scale	N/A	N/A	N/A	N/A	N/A
(c) Consumer Price Index	2.50%	2.50%	2.50%	2.50%	2.50%
(d) Mortality	GAM 1994	GAM 1994	1994 Uninsured Pensioner Mortality - Generational	CPM 2014 Private - Generational with scale CPM B	CPM 2014 Private - Generational with scale CPM B
(e) Turnover	Based on NOC experience for 1996 - 2006				
(f) Retirement age	Age 62, with the appropriate early retirement reduction, if any				
(g) Proportion married and age difference	80% married; male spouses are 3 years older				
(h) Expenses	Assume all expenses paid by company				
(i) Post-retirement indexing	1%				
(j) Asset Valuation Method	Market value of assets				
(k) Actuarial Cost Method	Unit credit				

* numbers may not add due to rounding

National Oil Full-Time Hourly Union Pension Plan
Solvency Valuation Results

2013 2014 2015 2015
Interest Rate
Sensitivity

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

1. Actuarial Accrued Liability:				
(a) Active participants	1,140,691	942,512	1,281,243	1,587,074
(b) Deferred vested participants	-	-	-	-
(c) Pensioners	266,988	253,923	323,957	359,592
(d) Total	1,407,679	1,196,435	1,605,200	1,946,666
2. Market Value of Assets				
	817,919	995,757	1,149,697	1,149,697
3. Solvency Deficiency: (1d)-(2)				
	589,760	200,678	455,502	796,968
4. Actuarial Basis				
(a) Interest - Benefit paid by lump sum	2.5% for 10 years 3.7% thereafter	3.1% for 10 years 4.6% thereafter	2.4% for 10 years 3.7% thereafter	1.4% for 10 years 2.7% thereafter
(a) Interest - Benefit settled by annuity purchase	3.0%	3.9%	2.6%	1.6%
(b) Mortality	UP 1994 - Generational	UP 1994 - Generational	UP 1994 - Generational	UP 1994 - Generational
(c) Retirement age	The age that produces the largest value			
(d) Proportion married and age difference	80% married; male spouses are 3 years older			
(e) Asset Valuation Method	Market value of assets			
(f) Actuarial Cost Method	Unit Credit			

* numbers may not add due to rounding

National Oil Part-Time DC Pension Plan

Eligibility	Immediate
Vesting	Immediate, effective July 1, 2012
Employer Contributions - Base	3% of base pay
Employer Contributions - Match	100% on the first 3% and 50% thereafter
Employee Contributions	Up to 6% of base pay
Plan Fund	The employer invests the contributions in a balanced fund. There are no employee investment choices.
Account Balance	Contributions are accumulated in member's individual account earning investment income at the rate of return earned by the Plan Fund.
Benefit on Termination or Retirement	Account balance is transferred to a LIRA/LIF 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

2012 2013 2014 2015

Participant Summary

(a) number participating during prior year	7,200	7,100	7,200	7,300
(b) average age	31.0	31.4	31.0	31.6
(c) average base pay	31,000	31,900	32,000	32,300

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	119,341	137,575	160,752	189,569
Employee Contributions during prior year	8,928	9,060	9,216	9,432
Company Contributions during prior year	14,508	14,722	14,976	15,326
Benefit Payments during prior year	(6,480)	(7,881)	(8,849)	(10,059)
Expenses during prior year	-	-	-	-
Investment return during prior year	1,278	7,276	13,474	11,815
Market Value of Assets at January 1 of current year	<u>137,575</u>	<u>160,752</u>	<u>189,569</u>	<u>216,083</u>
Rate of return during prior year	1%	5%	8%	6%

** numbers may not add due to rounding*