
Financial Reporting and Analysis
Chapter 14 Solutions
Pensions and Postretirement Benefits
Exercises

Exercises

E14-1. Determining projected benefit obligation
(AICPA adapted)

The projected benefit obligation on 12/31/01 is computed as follows:

Projected benefit obligation, 1/1/01	\$72,000
Service cost	18,000
Interest cost on beginning PBO (10% × \$72,000)	7,200
Benefit payments	<u>(15,000)</u>
Pension benefit obligation 12/31/01	<u>\$82,200</u>

E14-2. Pension liability on balance sheet
(AICPA adapted)

SFAS No. 87 requires that companies report a minimum pension liability. This amount is equal to the excess of the ABO over the fair value of plan assets (\$4,300,000 - \$3,450,000 = **\$850,000**). This is the amount reported in the balance sheet.

E14-3. Determining prepaid pension cost
(AICPA adapted)

Funded status of the plan 12/31/01:	
Contributions	\$1,000,000
Return on plan assets (10% × \$1,000,000)	100,000
Less: Service costs + Interest costs	<u>(620,000)</u>
Amount of plan overfunding	<u>\$ 480,000</u>

E14-4. Determining employer's pension contribution
(AICPA adapted)

Since Webb fully funded its pension plan in 1998 and 1999, the beginning balance in the prepaid/accrued pension cost account is \$0. T-account analysis shown below provides the required contribution.

Prepaid/Accrued Pension Cost			
		\$0	1/1/00 Balance
2000 Contribution	\$50,000	75,000	2000 Pension expense
		90,000	2001 Pension expense
2001 Contribution	X		
		\$15,000	Target balance 12/31/01

A 2001 contribution of \$100,000 is needed to provide the target balance in the accrued pension liability account.

E14-5. Required additional pension liability (AICPA adapted)

The minimum liability is the excess of the accumulated benefit obligation (ABO) over the fair value of plan assets:

ABO on 9/30/01	\$380,000
Fair value of plan assets on 9/30/01	<u>(290,000)</u>
Minimum liability	<u>\$90,000</u>

The *additional liability* that must be recorded to produce the total minimum liability is \$90,000 + \$20,000 of prepaid pension cost = \$110,000.

E14-6. Determining actual return on plan assets (AICPA adapted)

The actual return on plan assets is equal to the beginning plan assets balance less the ending plan assets balance adjusted for contributions made to the plan and benefits paid to retirees during the period. The formula for determining the actual return is:

$$\begin{aligned} \text{Actual return} &= (\text{Ending plan assets} - \text{Beginning plan assets}) + \text{Benefits} - \text{Contributions} \\ \$150,000 &= (\$525,000 - \$350,000) + \$85,000 - \$110,000 \end{aligned}$$

E14-7. Determining accrued pension liability on balance sheet (AICPA adapted)

The accrued pension cost as of 12/31/01 is the excess of pension expense over the amounts funded in 2001, adjusted for the beginning debit balance in the prepaid pension cost account on 1/1/01. Pension expense for 2001 is:

Service cost	\$19,000
Interest cost	38,000
Expected return on plan assets	(22,000)
Amortization of unrecognized prior service cost	<u>52,000</u>
Pension expense	<u>\$87,000</u>

When pension expense is recorded, the offsetting credit is to the prepaid/accrued pension cost account. 2001 employer contributions (\$40,000) are debited to the prepaid/accrued pension cost account and credited to cash, resulting in 12/31/01 accrued pension cost of \$45,000:

Prepaid/Accrued Pension Cost			
Beginning balance 1/1/01	\$ 2,000	\$87,000	Expense for 2001
Funding for 2001	40,000		
		<u>\$45,000</u>	Ending balance 12/31/01

E14-8. Prepaid pension cost on balance sheet
(AICPA adapted)

The prepaid pension cost is the difference between pension costs funded and amounts expensed. Since the service cost for 2001 is fully funded, the prepaid pension cost is the difference between the funded portion and amortized portion of prior service costs determined as follows:

Funded portion of prior service cost	\$114,400
Amortized portion of prior service cost	<u>(83,400)</u>
Prepaid pension cost	<u>\$31,000</u>

E14-9. Prepaid pension cost on balance sheet
(AICPA adapted)

Prepaid pension cost is the amount of contribution less the amount of pension expense for the period. Service cost of \$150,000 is fully funded. Prior service cost amortized to expense for the year was \$24,000, but \$60,000 was contributed to fund prior service costs. Thus, the prepaid pension cost at 12/31/01 is computed as follows:

Prior service cost contribution	\$60,000
Amortization of prior service cost	<u>(24,000)</u>
Prepaid pension cost on 12/31/01	<u>\$36,000</u>

E14-10. Minimum pension liability
(AICPA adapted)

The first step is to find the minimum pension liability. This is the accumulated benefit obligation (ABO) less the fair market value (FMV) of the plan assets:

ABO	\$103,000
FMV of plan assets	<u>(78,000)</u>
Minimum pension liability	<u>\$ 25,000</u>

Next, we need to compute the prepaid/accrued pension cost balance as of 12/31/01.

Net pension expense for the period	\$90,000
Employer's contributions	<u>(70,000)</u>
Accrued pension liability	<u>\$20,000</u>

As shown, there is a \$20,000 accrued pension liability. This amount is smaller than the minimum liability prior to recognizing the additional pension liability. The additional minimum pension liability is determined as follows:

Minimum pension liability	\$25,000
Accrued pension liability already reported	<u>(20,000)</u>
Additional pension liability needed	<u>\$5,000</u>

E14-11. Determining postretirement expense (AICPA adapted)

Postretirement benefit cost is determined below:

Service cost	\$240,000
Interest on APBO	40,000
Amortization of transition obligation (\$200,000/20 years)	<u>10,000</u>
Postretirement benefit cost	<u>\$290,000</u>

E14-12. Determining pension expense (AICPA adapted)

Pension expense is calculated as follows:

Service cost	\$160,000
Interest cost	50,000
Expected return on plan assets	(35,000)
Amortization of unrecognized prior service costs	<u>5,000</u>
Pension expense	<u>\$180,000</u>

E14-13. Determining pension expense, actual and deferred return on plan assets

Requirement 1:

Determination of pension expense for Bostonian in 2001:

Service cost	\$120,000
Interest on beginning PBO (10% × \$2,500,000)	250,000
Expected return on plan assets (12% × \$2,000,000)	(240,000)
Amortization of net pension asset at transition	(40,000)
Amortization of unrecognized actuarial loss	<u>50,000</u>
Pension expense for 2001	<u>\$140,000</u>

Requirement 2:

Actual dollar return on plan assets for 2001:

Ending fair value of plan assets	\$2,300,000
- Beginning fair value of plan assets	(2,000,000)
+ Payments made to retirees	100,000
- Contributions made to plan during 2001	<u>(80,000)</u>
Actual dollar return on plan assets	<u>\$320,000</u>

Requirement 3:

Dollar amount that is deferred in 2001:

Actual dollar return	\$320,000
Expected return (12% × \$2,000,000)	<u>(240,000)</u>
Dollar return deferred	<u>\$80,000</u>

E14-14. Funded status reconciliation

Funded status reconciliation and solving for unrecognized net gain (loss).

Projected benefit obligation	(\$900,000)
Fair value of plan assets	<u>307,500</u>
Projected benefit obligation in excess of plan assets	(592,500)
Unrecognized prior service costs	190,000
Unamortized transition obligation	160,000
Unrecognized net (gain) loss	<u>plug</u>
Prepaid (accrued) pension cost	<u>(\$112,500)</u>

The amount needed to complete the funded status reconciliation is an unamortized net *loss* of \$130,000.

E14-15. Determining postretirement (healthcare) benefits expense and obligation

Requirement 1:

Determining postretirement expense:

	(\$ millions)
Service cost	\$35
Interest on beginning APBO (8% × \$300)	24
Amortization of unrecognized transition obligation (\$240/20 years)	12
Amortization of prior service cost credit (\$45/15 years)	<u>(3)</u>
Net postretirement expense	<u>\$68</u>

Requirement 2:

Determining 12/31/98 balance in accumulated postretirement benefit obligation account:

	(\$ millions)
Beginning balance 1/1/98	\$300
Service cost	35
Interest on beginning APBO	24
Benefits paid to retirees	<u>(64)</u>
Accumulated postretirement benefit obligation, 12/31/98	<u>\$295</u>

E14-16. Postretirement healthcare expenses and liability balance

Requirement 1:

Determination of postretirement health care expense for 2001:

Service cost		\$20,000
Interest on accumulated benefit obligation (8% × \$300,000)		24,000
Actual return on plan assets	(\$4,500)	
Less: Amount deferred	<u>1,500</u>	
Expected return on plan assets		(3,000)
Amortization of:		
Prior service cost credit		(5,000)
Cumulative unrecognized loss		7,000
Transition net loss		<u>15,000</u>
Postretirement expense		<u>\$58,000</u>

Requirement 2:

Determination of benefits paid out:

Determine this from an analysis of changes in the fair value of plan assets:

Beginning fair value on 1/1/01	\$30,000
+ Contributions to the plan	12,000
+ Actual return on plan assets	4,500
- Payments made to employees	<u>(plug)</u>
Ending fair value on 12/31/01	<u>\$40,000</u>

Distributions to employees equal \$6,500 to balance.

Requirement 3:

Balance of accumulated postretirement benefit obligation (APBO)
at 12/31/01:

Beginning balance	\$300,000
+ Service cost	20,000
+ Interest on beginning APBO balance	24,000
- Payments made to employees	<u>(6,500)</u>
Ending balance	<u>\$337,500</u>

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Problems

Problems

P14-1. Determining components of pension expense
(AICPA adapted)

Requirement 1:

Interest cost:

Beginning balance of PBO	\$600,000
× Discount rate	<u> x .08</u>
= Interest cost	<u>\$ 48,000</u>

Requirement 2:

Expected dollar return on plan assets:

Beginning balance of fair value of plan assets	\$720,000
× Expected rate of return on plan assets	<u> x .10</u>
= Expected return on plan assets	<u>\$ 72,000</u>

Requirement 3:

Actual return on plan assets:

Fair value of plan assets	
1/1/01 balance	\$720,000
Contributions during the year	0
Actual return on plan assets	X
12/31/01 balance	<u>\$825,000</u>

Actual return on plan assets = \$825,000 - \$720,000 + \$0 - \$0 = \$105,000

Requirement 4:

Balance in unrecognized prior pension gain account on 12/31/01:

Beginning balance on 1/1/01 (given)		\$96,000
Amount of beginning gain recognized (amortized)		
Beginning balance	\$96,000	
Corridor (\$720,000 plan assets × 10%)	<u>(72,000)</u>	
Excess	24,000	
Average service life	<u>÷ 12 yrs.</u>	
Amount recognized		(2,000)
Deferred gain on plan assets for 2001:		
Actual return = \$825,000 - \$720,000 =	\$105,000	
Expected return = 10% × \$720,000 =	<u>(72,000)</u>	
Deferred gain in current year		<u>33,000</u>
Ending balance on 12/31/01		<u><u>\$127,000</u></u>

Requirement 5:

Recognized prior service costs as a component of 2001 pension cost:

Unrecognized prior service cost (1/1/01)	\$240,000
Average service life of employees	<u>÷ 12</u>
= Amortization of prior service costs	<u><u>\$ 20,000</u></u>

Requirement 6:

Minimum amortization of unrecognized pension gain:

Step (1): Determine the “corridor” amount by taking 10% of the larger of PBO or the fair value of plan assets:

$$\$720,000 \times 10\% = \$72,000$$

Step (2): Calculate the difference between the value calculated in Step (1) and the unamortized prior pension gain:

$$\$96,000 - \$72,000 = \$24,000$$

Step (3): Amortize the value obtained in Step (2) over the average service life of the employees:

$$\$24,000/12 = \$2,000 \text{ (minimum amortization)}$$

P14-2. Determining Unrecognized Prior Service Cost Amortization, Pension Expense, Journal Entries, Net Gains or Losses and Related Amortization, and Reconciliation Schedule

Requirement 1:

Prior Service Cost Amortization

Year ended 2001	(292,000/10)	=	\$29,200
Year ended 2002	(292,000/10)	=	29,200

Requirement 2:

Actual Return on Plan Assets:

	<u>Fair Value Plan Assets</u>	
12/31/2000 balance	1,085,000	
Contributions	169,000	
Payments		0
Actual return	X	
12/31/2001 balance	<u>1,395,000</u>	

or, X = \$1,395,000 - \$1,085,000 - \$169,000
Actual return equals \$ 141,000

Requirement 3:

Unrecognized Net Gain for 2001:

Actual return on plan assets	\$ 141,000
Expected return (\$1,085,000 x 10%)	<u>(108,500)</u>
Unexpected gain	<u>\$ 32,500</u>

Requirement 4:

Pension Expense for 2001:

Service cost	\$ 117,400
Interest cost (\$1,377,000 x 10%)	137,700
Expected return	(108,500)
Amortization of prior service costs	<u>29,200</u>
	<u>\$ 175,800</u>

Requirement 5:

Required Pension Journal Entries for 2001:

Pension expense:

12/31/00 Prepaid / accrued pension costs	\$	0
2001 Pension expense		175,800
2001 Contribution		(169,000)
Accrued pension liability	\$	<u>6,800</u>

Minimum liability adjustment:

Accumulated benefit obligation (ABO)	\$	1,425,000
Plan assets at fair value		(1,395,000)
Minimum liability--Unfunded ABO		<u>30,000</u>
Less: Accrued pension liability		(6,800)
Minimum liability adjustment	\$	<u>23,200</u>

Journal entries:

DR Pension expense	\$175,800	
CR Cash		\$169,000
CR Accrued pension liability		6,800

To record pension expense for 2001

DR Intangible asset--Deferred		
Pension cost	\$23,200	
CR Additional pension liability		\$23,200

To record minimum liability adjustment at 12/31/01

Requirement 6:

Unrecognized Gains and Losses:

12/31/01 Fair value of plan assets (FVPA)		\$ 1,395,000
Less: Expected FVPA		
12/31/00 FVPA	\$ 1,085,000	
Expected return (10% of 12/31/00 FVPA)	108,500	
Contributions	169,000	
Less benefits paid	<u>0</u>	
		<u>1,362,500</u>
Asset gain (unexpected gain)		32,500
12/31/01 Actuarially computed Pension Benefit Obligation (PBO)	1,450,000	
Less:		
12/31/00 PBO	1,377,000	
Plus service cost	117,400	
Plus interest cost	137,700	
Less benefits paid	<u>0</u>	
	<u>1,632,100</u>	
Liability gain		<u>182,100</u>
Unrecognized net gain at 12/31/01		<u>\$ 214,600</u>

Requirement 6 (continued):

Amortization of Unrecognized Gains — Corridor Approach:

<u>Year</u>	<u>PBO</u>	<u>Market Related Value of Plan Assets</u>	<u>Corridor</u>	<u>Unrecognized Net Gain</u>	<u>Amortization</u>
2000	\$1,377,000	\$1,085,000	\$ 137,700	0	0
2001	1,450,000	1,180,000	145,000	214,600	6,960*

2001 Amortization: None since there was no beginning balance

2002 Amortization: \$6,960 (Corridor approach)

*Amortization equals: $\$214,600 - \$145,000 = \$69,600$; $\$69,600 / 10 =$ \$ 6,960

Requirement 7:

Reconciliation for 2001:

<u>Funded Status of Plan</u>		<u>Recognized / Unrecognized Amounts</u>	
Projected benefit obligation	\$ (1,450,000)	Recognized Amounts	
		Net minimum liability	\$ (30,000)
Plan assets at fair value	1,395,000	Unrecognized Amounts	
		Unrecognized net gain	214,600
		Unrecognized prior service costs	(262,800)
		Adjustment required to recognize minimum pension liability	23,200
Excess of projected benefit obligation over plan assets	<u>\$ (55,000)</u>	Excess of projected benefit obligation over plan assets	<u>\$ (55,000)</u>

P14-3. Determining Unrecognized Prior Service Cost Amortization, Pension Expense, Journal Entries, Net Gains or Losses and Related Amortization, and Reconciliation Schedule

Requirement 1:

Fair value of plan assets

Expected return for 2002	\$ 227,800
Divided by the expected rate of return for 2002	10%
Fair value of plan assets for 2001	<u><u>\$ 2,278,000</u></u>

Requirement 2:

Prior Service Cost Amortization:

Year ended 2001 (\$400,000 / 15)	=	\$ 26,667
Year ended 2002 (\$400,000 / 15)	=	26,667

Requirement 3:

Actual return on plan assets:

Expected return (\$2,100,000 x 10%)	\$ 210,000
Unexpected loss (\$114,000 - \$33,000)	<u>(81,000)</u>
	<u><u>\$ 129,000</u></u>

Requirement 4:

Benefit payments made during 2001:

	Fair Value Plan Assets	
12/31/2000 balance	\$ 2,100,000	X
Contributions	321,000	
Benefit payments		
Actual return	129,000	
12/31/2001 balance	<u><u>\$ 2,278,000</u></u>	

or, X = \$2,278,000 - \$2,100,000 - \$321,000 - \$129,000

Benefits paid \$ (272,000)

Requirement 5:

Compute pension expense for 2001:

Service cost	\$ 214,000
Interest cost (\$2,500,000 x 9%)	225,000
Expected return	(210,000)
Amortization of prior service costs	26,667
	<u>\$ 255,667</u>

Requirement 6:

Required Pension Journal Entries for 2001:

Pension expense:

12/31/00 Prepaid / accrued pension costs	\$ 0
2001 Pension expense	255,667
2001 Contribution	(321,000)
Prepaid pension cost	<u>\$ (65,333)</u>

Minimum liability adjustment:

Accumulated benefit obligation (ABO)	\$ 2,335,000
Plan assets at fair value	(2,278,000)
Minimum liability--Unfunded ABO	57,000
Plus: Prepaid pension cost	65,333
Minimum liability adjustment	<u>\$ 122,333</u>

Journal entries:

DR Pension expense	\$255,667	
DR Prepaid pension cost	65,333	
CR Cash		\$321,000

To record pension expense for 2001

DR Intangible asset--Deferred pension cost	\$122,333	
CR Additional pension liability		\$122,333

To record minimum liability adjustment at 12/31/01

Requirement 7:**Unrecognized Gains and Losses:**

12/31/01 Fair value of plan assets (FVPA)		\$2,278,000
Less: Expected FVPA:		
12/31/00 FVPA	\$2,100,000	
Expected return (10% of 12/31/00 FVPA)	210,000	
Contributions	321,000	
Less benefits paid	<u>(272,000)</u>	
		<u>2,359,000</u>
Asset loss (unexpected loss)		(81,000)
12/31/01 Actuarially computed Pension Benefit Obligation (PBO)	2,700,000	
Less:		
12/31/00 PBO	2,500,000	
Plus service cost	214,000	
Plus interest cost	225,000	
Less benefits paid	<u>(272,000)</u>	
		<u>2,667,000</u>
Liability loss		<u>(33,000)</u>
Unrecognized net loss at 12/31/01		<u>\$ (114,000)</u>

Amortization of Unrecognized Gains — Corridor Approach:

<u>Year</u>	<u>PBO</u>	<u>Market Related Value of Plan Assets</u>	<u>Corridor</u>	<u>Unrecognized Net Loss</u>	<u>Amortization</u>
2000	\$2,500,000	2,100,000	250,000	0	0
2001	2,700,000	2,140,000	270,000	114,000	0

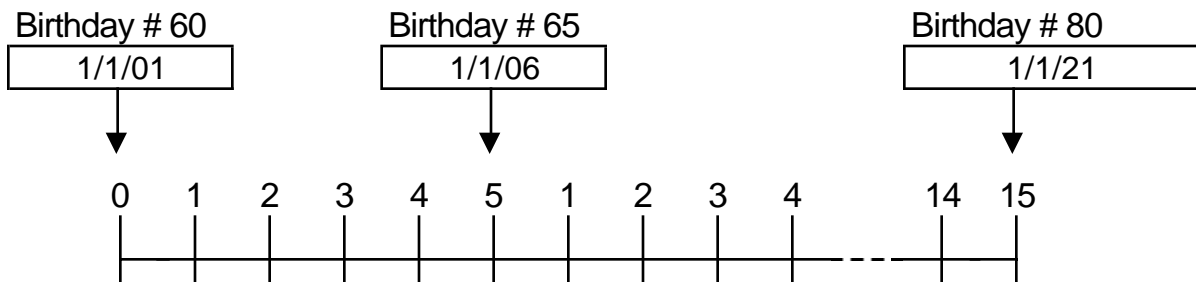
2001 Amortization: None since there was no beginning balance

2002 Amortization: None. Unrecognized net loss did not exceed the corridor

Requirement 8:
Reconciliation for 2001:

Funded Status of Plan		Recognized / Unrecognized Amounts	
Projected benefit obligation	\$ (2,700,000)	Recognized Amounts	
		Net minimum liability	\$ (57,000)
Plan assets at fair value	2,278,000	Unrecognized Amounts	
		Unrecognized net loss	(114,000)
		Unrecognized prior service costs	(373,333)
		Adjustment required to recognize minimum pension liability	122,333
Excess of projected benefit obligation over plan assets	<u>\$ (422,000)</u>	Excess of projected benefit obligation over plan assets	<u>\$ (422,000)</u>

P14-4 (Determining PBO and ABO)



Known information:

- Ms. Abbott plans to retire 1/1/2006 and receive her first benefit payment 1/1/2007.
- Ms. Abbott's expected benefit payment is \$36,000 (\$60,000 x 60%).
- Ms. Abbott is expected to receive 15 benefit payments of \$36,000.
- Calculations required:
 - Present value of an annuity (PVA) of \$36,000 for 15 years. (This will provide the present value of the 15 individual \$36,000 payments as of 1/1/2006.)
 - Present value single sum calculation of the PVA at 1/1/2006 discounted 5 periods. (This will give the present value of the 15 projected benefit payments as of 1/1/2001.)

Requirement 1:

Compute the projected benefit obligation at 1/1/2001:

- Discount rate = 8%
- Benefit payment = \$36,000 (\$60,000 x 60%)
- Present Value of the Annuity (PVA) periods = 15
- Present Value Single Sum (PVSS) periods = 5
- Note: PVDFFA or PVDFSS is the Present Value Discount Factor for the annuity or the single sum.

PVA at 1/1/2006 = Benefit payment x PVDFFA@8%,15

PVA at 1/1/2006 = \$36,000 x 8.55948

PVA at 1/1/2006 = \$ 308,141

PVSS at 1/1/2001 = PVA at 1/1/2006 x PVDFSS@8%,5

PVSS at 1/1/2001 = \$308,141 x 0.68058

PVSS at 1/1/2001 = \$ 209,715

Projected Benefit Obligation at 1/1/2001 is \$ 209,715

Requirement 2:

Compute the accumulated benefit obligation at 1/1/2001:

Same calculation as Requirement 1, except benefit payment ignores future salary increases, and is based on current salary level.

- Discount rate = 8%
- Benefit payment = \$28,800 (\$48,000 x 60%)
- Present Value of the Annuity (PVA) periods = 15
- Present Value Single Sum (PVSS) periods = 5

PVA at 1/1/2006 = Benefit payment x PVDFSA@8%,15

PVA at 1/1/2006 = \$28,800 x 8.55948

PVA at 1/1/2006 = \$ 246,513

PVSS at 1/1/2001 = PVA at 1/1/2006 x PVDFSS@8%,5

PVSS at 1/1/2001 = \$246,513 x 0.68058

PVSS at 1/1/2001 = \$ 167,772

Accumulated Benefit Obligation at 1/1/2001 is \$ 167,772

Requirement 3:

Compute the projected benefit obligation at 1/1/2001:

Same calculation as Requirement 1, except discount rate is 11%.

- Discount rate = 11%
- Benefit payment = \$36,000 (\$60,000 x 60%)
- Present Value of the Annuity (PVA) periods = 15
- Present Value Single Sum (PVSS) periods = 5

PVA at 1/1/2006 = Benefit payment x PVDFSA@11%,15

PVA at 1/1/2006 = \$36,000 x 7.19087

PVA at 1/1/2006 = \$ 258,871

PVSS at 1/1/2001 = PVA at 1/1/2006 x PVDFSS@11%,5

PVSS at 1/1/2001 = \$258,871 x 0.59345

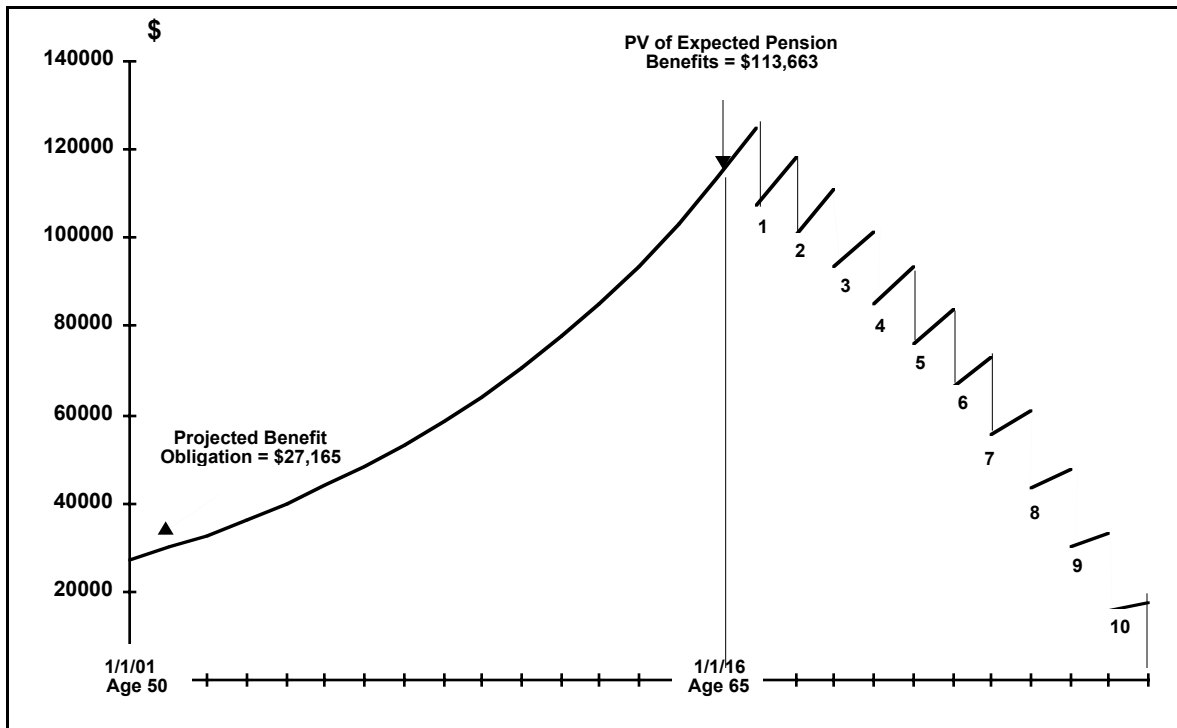
PVSS at 1/1/2001 = \$ 153,627

Projected Benefit Obligation at 1/1/2001 is \$ 153,627

P14-5. PBO, ABO and pension expense

Requirement 1:

Calculation of projected benefit obligation on January 1, 2001:



Annual pension benefits starting on 12/31/16 and continuing for 10 years thereafter (11 years total = 76 - 65).

Years of service credit as of 1/1/01: (10 yrs. × \$250)	\$2,500
Benefits tied to expected salary at retirement: (50% × \$30,000)	<u>5,000</u>
Total annual pension benefit based on service credit earned up to 1/1/01	<u>\$17,500</u>

PV of expected pension benefits as of 1/1/16 (date of *retirement*):

$$P_{OA} \text{ for 11 periods @ } 10\% \times \$17,500 \\ = 6.495 \times \$17,500 = \underline{\underline{\$113,663}}$$

Projected benefit obligation on 1/1/01 (date *plan adopted*):

$$\text{PV of single amount for 15 periods @ } 10\% \\ = 0.239 \times \$113,663 = \underline{\underline{\$27,165}}$$

Accumulated benefit obligation on actual salary level attained as of the date of computation (ignores future salary increase):

Benefits tied to actual salary as of 1/1/01:
 $50\% \times \$20,000$ \$10,000

Benefits tied to years of service credit as of 1/1/01:
 $10 \text{ yrs.} \times \$250$ 2,500

Total annual pension benefit based on service credit and salary level as of 1/1/01 \$12,500

PV of expected pension benefits as of 1/1/16 (date of retirement):

P_{OA} for 11 periods @ 10% \times \$12,500
 $= 6.495 \times \$12,500 =$ \$81,188

Accumulated benefit obligation on 1/1/01 (date of adoption):

PV of single amount for 15 periods @ 10%
 $= 0.239 \times \$81,188 =$ \$19,403

Note: Projected benefit obligation > accumulated benefit obligation
\$27,165 \$19,403

Requirement 2:

Calculation of projected benefit obligation on 1/1/02:

Benefit based on years of service credit as of 1/1/02:
 $11 \text{ yrs.} \times \$250$ \$2,750

Benefits tied to expected salary at retirement:
 $50\% \times \$30,000$ 15,000

Total annual pension benefit based on expected salary and service credit earned up to 1/1/02 \$17,750

PV of expected pension benefits as of 1/1/16:

P_{OA} for 11 periods @ 10% \times \$17,750
 $= 6.495 \times \$17,750 =$ \$115,286

Projected benefit obligation on 1/1/02:

PV of single amount for 14 periods @ 10%
 $= 0.263 \times \$115,286 =$ \$30,320

Requirement 3:

Calculation of pension expense for 2001:

Projected benefit obligation on 1/1/02	=	\$30,320
Projected benefit obligation on 1/1/01	=	<u>27,165</u>
Difference = Service cost + Interest for 2001	=	<u>\$ 3,155</u>

Service cost component

$$P_{OA} \text{ for 11 periods @ } 10\% \times \$250 \\ = 6.495 \times \$250 = \underline{\$1,624}$$

$$\text{PV of single amount for 14 periods @ } 10\% \times \$1,624 \\ = 0.263 \times \$1,624 = \quad \quad \quad + 428^*$$

Interest component on PBO

$$10\% \times \$27,165 \quad \quad \quad + 2,717^*$$

* Note: \$428 + \$2,717 does not equal \$3,155 due to rounding error from using only three decimal places in PV calculations.

Return on plan assets

$$\text{Nothing invested as of the beginning of 2001} \quad \quad \quad 0$$

Amortization of prior service cost

$$\$27,165/15 \text{ yrs.} = \quad \quad \quad + 1,811$$

Amortization of actuarial gains/losses

0

Amortization of transition amount

0

Total pension expense for 2001

\$4,956**P14-6. PBO, ABO and pension expense****Requirement 1:**

With the entire amount of PBO funded on Jan. 1, 2001, the return on plan assets (net of any deferral) reduces pension expense. The calculation of pension expense would be as follows for 2001:

Service cost		\$428
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Interest on PBO

10% × \$27,165		+ 2717
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Return on plan assets		
Actual = 12% × \$27,165	=	\$3,260
Deferred = (12% - 10%) × \$27,165	=	<u>(543)</u>
Expected		(\$2,717)
Amortization of prior service cost		
\$27,165/15 yrs. =		+ 1,811
Amortization of actuarial gain/losses		
(None, since amount of deferred gain does not exceed the corridor)		0
Amortization of transition amount		<u>0</u>
Total pension expense 2001		<u>\$2,239</u>

Requirement 2:

Calculation of fair market value of plan assets on Dec. 31, 2002:

Initial amount funded on Jan.1, 2001	\$27,165
Actual return on plan assets in 2001	
12% × \$27,165	3,260
2001 service costs funded on Dec. 31, 2001	<u>428</u>
Fair market value of plan assets on Dec. 31, 2001	\$30,853
Actual return on plan assets in 2002	
10% × \$30,853	3,085
2002 service cost funded on Dec. 31, 2002 ¹	<u>724</u>
Total pension assets on Dec. 31, 2002	\$34,662
Projected benefit obligation on Dec. 31, 2002 ²	<u>39,932</u>
Net underfunded position on 12/31/02	<u>\$5,270</u>

¹ Pension expense for 2002:

Service cost

 P_{OA} for 11 periods @ 9% × \$250

 = 6.8052 × \$250 = \$1,701

 PV of single amount for 13 periods @ 9%

 = 0.3262 × \$1,701

=

\$555

Interest on PBO at Jan.1, 2002

 9% × \$36,153^a

3,254

Actual return on plan assets		
10% × \$30,853 =	(3,085)	
Less: Amount deferred	<u>0</u>	(\$3,085)
Amortization of prior service costs: \$27,165/15 yrs. =		+ 1,811
Amortization of actuarial gains/losses		0
Amortization of transition amount		<u>0</u>
Total pension expense for 2002		\$2,535
Less: Amortization of prior service costs which were prefunded		<u>(1,811)</u>
Amount of pension expense funded in 2002		<u>\$724</u>

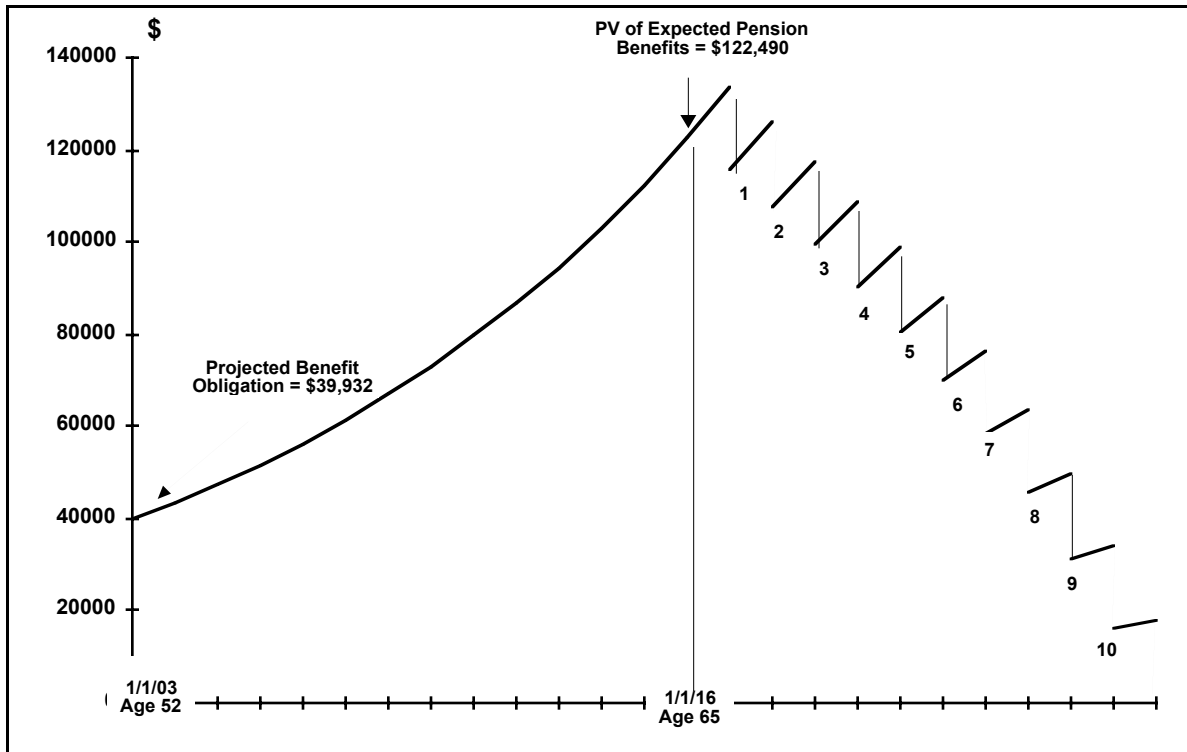
^a Calculation of PBO on Jan. 1, 2002 based on 9% discount rate

Years of service credit earned as of 2002: 11 yrs. × \$250	\$2,750
Benefits tied to expected salary at retirement: 50% × \$30,000	<u>15,000</u>
Total annual pension benefit based on service credit earned up to 2002	<u>\$17,750</u>
PV of expected pension benefits as of 2016:	
P_{OA} for 11 periods @ 9% × \$17,750 = 6.8052 × \$17,750 =	\$120,792
PBO on 1/1/02:	
PV of single amount for 14 periods @ 9% = 0.2993 × \$120,792 =	<u>\$36,153</u>

² Annual pension benefits starting on 12/31/16 and continuing for 10 years thereafter (11 years total).

Years of service credit earned as of 12/31/02: 12 yrs. × \$250	\$3,000
Benefits tied to expected salary at retirement: 50% × \$30,000	<u>15,000</u>
Total annual pension benefit based on service credit earned up to 12/31/02	<u>\$18,000</u>
PV of expected pension benefits as of 1/1/16 (date of retirement):	
P_{OA} for 11 periods @ 9% × \$18,000	
= 6.805 × \$18,000 =	\$122,490
Projected benefit obligation on 12/31/02:	
PV of single amount for 13 periods @ 9%	
= 0.326 × \$122,490 =	<u>\$39,932</u>

Calculation of Projected Benefit Obligation on December 31, 2002: (9% Settlement Rate)



Explanation for Change in Funded Status:

The ABC Co. pension obligation was fully funded on December 31, 2001 based on a 10% discount rate assumption (amount funded = \$30,853 > PBO = \$30,320). Despite the fact that the pension expense provision in 2002 was fully funded, the pension fund is **underfunded** by \$5,270 on 12/31/02 due to the fact that the discount rate (settlement rate) assumption used in computing the PBO for ABC Co. has declined from 10% to 9%. As the discount rate declines, the present value of the pension obligation increases.

P14-7. Effect of funding and discount rate assumption on pension expense

Requirement 1:

End of Year 1	Annual Salary 2	Cumulative Salary 3	Total Vested Pension 4	Vested During the Year 5	Discount Period 6	PV Factor 7	PV of Total Vested Pension 8
2001	\$50,000	\$50,000	\$12,500	\$12,500	4	0.68301	\$8,538
2002	60,000	110,000	27,500	15,000	3	0.75131	20,661
2003	70,000	180,000	45,000	17,500	2	0.82645	37,190
2004	80,000	260,000	65,000	20,000	1	0.90909	59,091
2005	-	260,000	65,000	-	0	1.00000	65,000

The above table shows the present value of the total vested pension benefits over the period 2001–2005. At the end of each year, the total vested pension benefits (4) is calculated by multiplying the cumulative salary (3) by 25%. The year-to-year change in column (4) represents the pension vested during the year (5). Regardless of when the employee retires, the pension is payable only at the end of year 2005. Consequently, the present value of the total vested pension benefits is calculated by discounting the total vested pension amount for the discount period mentioned in column (6) using a discount rate of 10%.

Based on this information, the pension expense is calculated as follows:

Year	Vested During the Year	PV Factor	PV of Total Vested Pension	Change in the PV	Service Cost	Interest Cost
2001	\$12,500	0.68301	\$8,538	\$8,538	\$8,538	-
2002	15,000	0.75131	20,661	12,123	11,270	854
2003	17,500	0.82645	37,190	16,529	14,463	2,066
2004	20,000	0.90909	59,091	21,901	18,182	3,719
2005	-	1.00000	65,000	<u>5,909</u>	<u>-</u>	<u>5,909</u>
				<u>\$65,000</u>	<u>\$52,452</u>	<u>\$12,548</u>

Conceptually, the annual pension expense for an unfunded plan is the change in the present value of the total vested pension benefit. The service cost is calculated by multiplying the amount vested during the year by the appropriate present value factor. The interest cost for a given year is calculated by multiplying the present value of the total vested pension benefit at the end of the previous year by the discount rate. Subject to rounding error, the sum of the service cost and the interest cost equals the change in the present value of the total vested pension benefits.

2001	DR	Pension expense	\$ 8,538	
	CR	Pension liability		\$ 8,538
2002	DR	Pension expense	\$12,123	
	CR	Pension liability		\$12,123
2003	DR	Pension expense	\$16,529	
	CR	Pension liability		\$16,529
2004	DR	Pension expense	\$21,901	
	CR	Pension liability		\$21,901
2005	DR	Pension expense	\$ 5,909	
	CR	Pension liability		\$ 5,909
	DR	Pension liability	\$65,000	
	CR	Cash		\$65,000

Requirement 2:

In this case, the pension expense will exactly equal the service cost:

<u>Year</u>	<u>Service Cost</u>	<u>Interest Cost</u>	<u>Return on Plan Assets</u>	<u>Pension Expense</u>
2001	\$ 8,538	-	-	\$ 8,538
2002	11,270	854	(854)	11,270
2003	14,463	2,066	(2,066)	14,463
2004	18,182	3,719	(3,719)	18,182
2005	-	5,909	(5,909)	-
Total	<u>\$52,452</u>	<u>\$12,548</u>	<u>\$(12,548)</u>	<u>\$52,452</u>

2001	DR Pension expense	\$ 8,538	
	CR Cash		\$ 8,538
2002	DR Pension expense	\$11,270	
	CR Cash		\$11,270
2003	DR Pension expense	\$14,463	
	CR Cash		\$14,463
2004	DR Pension expense	\$18,182	
	CR Cash		\$18,182
2005	DR Pension expense	-	
	CR Cash		-

Requirement 3:

Under the unfunded scenario, the pension expense is the sum of the service cost and interest cost, which equals \$65,000 over the period 2001–2005. In the fully funded case, the pension expense equals only the service cost of \$52,452. Note that in the fully funded case, the company is relinquishing the use of cash every period equal to the service cost. How much money could the company earn by investing the service cost in an investment that offers an annual rate of return of 10%?

<u>Year</u>	<u>Annual Contributions</u>	<u>Investment Period</u>	<u>FV Factor</u>	<u>Future Value</u>	<u>Income Earned</u>
2001	\$ 8,538	4	1.46410	\$12,500	\$ 3,962
2002	11,270	3	1.33100	15,000	3,730
2003	14,463	2	1.21000	17,500	3,037
2004	18,182	1	1.10000	20,000	1,818
2005	-	0	1.00000	-	-
Total	<u>\$52,452</u>			<u>\$65,000</u>	<u>\$12,548</u>

Consequently, in the unfunded case, if the company had invested the service cost, then it would have earned \$12,548 over the period 2001-2005 assuming a rate of return of 10%. Therefore, under the unfunded option, the company's income will be higher because of the opportunity cost of being able to invest the cash saved from not funding the pension plan. This will be compensated by the higher pension expense.

Pension expense in the unfunded case	\$65,000
- Income forgone by funding	<u>(12,548)</u>
Pension expense in the fully funded case	<u>\$52,452</u>

Requirement 4:

Year	Discount Rate = 5%			Discount Rate = 10%			Discount Rate = 15%		
	Service Cost	Interest Cost	Total Expense	Service Cost	Interest Cost	Total Expense	Service Cost	Interest Cost	Total Expense
2001	\$10,284	-	\$10,284	\$ 8,538	-	\$ 8,538	\$ 7,147	-	\$ 7,147
2002	12,958	\$ 514	13,472	11,270	\$ 854	12,123	9,863	\$ 1,072	10,935
2003	15,873	1,188	17,061	14,463	2,066	16,529	13,233	2,712	15,945
2004	19,047	2,041	21,088	18,182	3,719	21,901	17,391	5,104	22,495
2005	-	3,095	3,095	-	5,909	5,909	-	8,478	8,478
	\$58,162	\$6,838	\$65,000	\$52,452	\$12,548	\$65,000	\$47,633	\$17,367	\$65,000

The following observations emerge from this comparison:

- (1) Over the life of a company, the total pension expense is the same regardless of the assumed discount rate.
- (2) However, the service cost is lower when the discount rate is higher, whereas the interest cost increases with the discount rate.
- (3) Since interest cost represents the time value of money, more of the interest cost is recorded in later years when the discount rate is higher. This would result in a larger pension expense being recorded earlier when discount rates are lower.

P14-8. Determining effect of discount rate assumptions on pension expense and PBO

Note to the instructor: In order to minimize the effects of rounding errors, the solutions show all figures in dollars and cents.

First, let us focus on the case when the discount rate equals the rate of return on plan assets - 10%:

Requirement 1: Annual pension expense

Assumptions: Discount rate = 10% and Rate of return on plan assets = 10%

End of Year 1	Annual Salary 2	Cumulative Salary 3	Total Vested Pension 4	Vested During the Year 5	Discount Period 6	PV Factor 7	PV of Total Vested Pension 8
2001	\$50,000	\$50,000	\$12,500	\$12,500	4	0.68301	\$8,537.63
2002	60,000	110,000	27,500	15,000	3	0.75131	20,661.03
2003	70,000	180,000	45,000	17,500	2	0.82645	37,190.25
2004	80,000	260,000	65,000	20,000	1	0.90909	59,090.85
2005	-	260,000	65,000	-	0	1.00000	65,000.00

Note that the PV of total vested pension represents the projected benefit obligation.

The following table summarizes the activities in the pension fund.

	<u>Pension Fund Investments and Earnings</u>					
	<u>2001</u>	<u>2002</u>	<u>2003</u>	<u>2004</u>	<u>2005</u>	<u>Future Value</u>
Contributions	\$8,475.00	\$ 847.50	\$ 932.25	\$ 1,025.48	\$ 1,128.02	\$12,408.25
Contributions		11,000.00	1,100.00	1,210.00	1,331.00	14,641.00
Contributions			15,000.00	1,500.00	1,650.00	18,150.00
Contributions				18,000.00	1,800.00	19,800.00
Year-end balance	\$8,475.00	\$20,322.50	\$37,354.75	\$59,090.23	\$64,999.25	\$64,999.25
Income earned	-	\$ 847.50	\$ 2,032.25	\$ 3,735.48	\$ 5,909.02	

The highlighted diagonal figures represent the inflow of cash from Magee Corp. The figures to the right of these numbers represent the future return earned by the pension fund from investing these cash flows at 10% per annum. Due to the compounding effect, the income from investment keeps increasing over time (as we move to the right). For instance, \$8,475 in 2001 earns \$847.50 (i.e., 10% of \$8,475) during 2002, \$932.25 [10% of (\$8,475.00 + \$847.50)] in 2003, and so on. The future value indicates the value to which each year's cash inflow will grow by investing at 10% through the end of 2005. Except for rounding errors, note that the future value of each year's cash inflow corresponds to the pension vested during the same year shown in the previous table.

The row titled "Year-end balance" provides the fair value of the plan assets at the end of each of the years. Of course, at the end of year 2005, the investments will be liquidated and the cash will be disbursed to the employee. The last row indicates the annual return on plan assets.

Based on the above information, we now calculate the pension expense as follows:

<u>Year</u>	<u>Service Cost</u>	<u>Interest Cost</u>	<u>Return on Plan Assets</u>	<u>Pension Expense</u>
2001	\$ 8,537.67	-	-	\$ 8,537.67
2002	11,269.72	\$ 853.77	(\$ 847.50)	11,275.99
2003	14,462.81	2,066.12	(2,032.25)	14,496.68
2004	18,181.82	3,719.01	(3,735.48)	18,165.35
2005		5,909.09	(5,909.02)	0.07
				<u>\$52,475.75</u>

Note: The figures for pension contributions were chosen such that the pension expense will approximate the service cost when the discount rate equals the rate of return on pension assets. Consequently, the balance in the pension fund at the end of the year 2005 (\$64,999.25) approximates the pension liability of \$65,000.

The funding status of the pension plan is provided below:

Requirement 2: Funded status under 10% discount rate

<u>End of Year</u>	<u>2001</u>	<u>2002</u>	<u>2003</u>	<u>2004</u>
Projected benefit obligation	\$8,537.67	\$20,661.16	\$37,190.08	\$59,090.91
- Fair value of plan assets	<u>(8,475.00)</u>	<u>(20,322.50)</u>	<u>(37,354.75)</u>	<u>(59,090.23)</u>
Net pension liability (asset)	<u>\$ 62.67</u>	<u>\$ 338.66</u>	<u>(\$ 164.67)</u>	<u>\$ 0.68</u>

The balance in net pension liability (asset) can verified by preparing the T-account:

<u>Pension Liability (Asset) at Year-End</u>	<u>2001</u>	<u>2002</u>	<u>2003</u>	<u>2004</u>	<u>2005</u>
Beginning balance	-	\$ 62.67	\$ 338.66	(\$ 164.67)	\$ 0.68
Pension expense	\$8,537.67	11,275.99	14,496.68	18,165.35	0.07
Cash received (paid)	<u>(8,475.00)</u>	<u>(11,000.00)</u>	<u>(15,000.00)</u>	<u>(18,000.00)</u>	<u>(0.75)</u>
Ending balance	<u>\$ 62.67</u>	<u>\$ 338.66</u>	<u>(\$ 164.67)</u>	<u>\$ 0.68</u>	<u>(\$0.00)</u>

The tables are now reported under the other two scenarios regarding the discount rates.

Requirement 1: Annual pension expense

Assumptions: Discount rate = 8% and rate of return on plan assets = 10%

End of Year	Annual Salary	Cumulative Salary	Total Vested Pension	Vested During the Year	Discount Period	PV Factor	PV of Total Vested Pension
1	2	3	4	5	6	7	8
2001	\$50,000	\$ 50,000	\$12,500	\$12,500	4	0.73503	\$ 9,187.87
2002	60,000	110,000	27,500	15,000	3	0.79383	21,830.39
2003	70,000	180,000	45,000	17,500	2	0.85734	38,580.25
2004	80,000	260,000	65,000	20,000	1	0.92593	60,185.19
2005	-	260,000	65,000	-	0	1.00000	65,000.00

Note that the pension fund investments and earnings will be identical under all the three scenarios. This is because the cash contributions to the pension fund and the rate of return earned by the pension fund are assumed to be the same regardless of the discount rate assumption. Consequently, the table showing the pension fund investments and earnings is not reported again.

Year	Service Cost	Interest Cost	Return on Plan Assets	Pension Expense
2001	\$ 9,187.87	-	-	\$ 9,187.87
2002	11,907.48	\$ 735.03	(\$ 847.50)	11,795.01
2003	15,003.43	1,746.43	(2,032.25)	14,717.61
2004	18,518.52	3,086.42	(3,735.48)	17,869.46
2005		4,814.81	(5,909.02)	<u>(1,094.21)</u>
				<u>\$52,475.75</u>

Requirement 2: Funded status under 8% discount rate

End of Year	2001	2002	2003	2004
Projected benefit obligation	\$9,187.87	\$21,830.39	\$38,580.25	\$60,185.19
- Fair value of plan assets	<u>(8,475.00)</u>	<u>(20,322.50)</u>	<u>(37,354.75)</u>	<u>(59,090.23)</u>
Net pension liability (asset)	<u>\$ 712.87</u>	<u>\$ 1,507.89</u>	<u>\$ 1,225.50</u>	<u>\$ 1,094.96</u>

Pension Liability (Asset) at Year-End	2001	2002	2003	2004	2005
Beginning balance	-	\$ 712.87	\$ 1,507.89	\$ 1,225.50	\$1,094.96
Pension expense	\$9,187.87	(11,795.01)	14,717.61	17,869.46	(1,094.21)
Cash received (paid)	<u>(8,475.00)</u>	<u>(11,000.00)</u>	<u>(15,000.00)</u>	<u>(18,000.00)</u>	<u>(0.75)</u>
Ending balance	<u>\$ 712.87</u>	<u>\$ 1,507.89</u>	<u>\$ 1,225.50</u>	<u>\$ 1,094.96</u>	<u>(\$ 0.00)</u>

Requirement 1: Annual pension expense

Assumptions: Discount rate = 12% and rate of return on plan assets = 10%

End of Year	Annual Salary	Cumulative Salary	Total Vested Pension	Vested During the Year	Discount Period	PV Factor	PV of Total Vested Pension
1	2	3	4	5	6	7	8
2001	\$50,000	\$ 50,000	\$12,500	\$12,500	4	0.63552	\$ 7,943.98
2002	60,000	110,000	27,500	15,000	3	0.71178	19,573.96
2003	70,000	180,000	45,000	17,500	2	0.79719	35,873.72
2004	80,000	260,000	65,000	20,000	1	0.89286	58,035.71
2005	-	260,000	65,000	-	0	1.00000	65,000.00

Year	Service Cost	Interest Cost	Return on Pension Plan Assets	Expense
2001	\$ 7,943.98	-	-	\$ 7,943.98
2002	10,676.70	\$ 953.28	(\$ 847.50)	10,782.48
2003	13,950.89	2,348.87	(2,032.25)	14,267.52
2004	17,857.14	4,304.85	(3,735.48)	18,426.51
2005		6,964.29	(5,909.02)	<u>1,055.26</u>
				<u>\$52,475.75</u>

Requirement 2: Funded status under 12% discount assumption

End of year	2001	2002	2003	2004
Projected benefit obligation	\$7,943.98	\$19,573.96	\$35,873.72	\$58,035.71
- Fair value of plan assets	<u>(8,475.00)</u>	<u>(20,322.50)</u>	<u>(37,354.75)</u>	<u>(59,090.23)</u>
Net pension liability (asset)	<u>(\$ 531.02)</u>	<u>(\$ 748.54)</u>	<u>(\$ 1,481.03)</u>	<u>(\$ 1,054.51)</u>

Pension Liability

(Asset) at Year-End	2001	2002	2003	2004	2005
Beginning balance	-	(\$ 531.02)	(\$748.54)	(\$1,481.03)	(\$1,054.51)
Pension expense	\$7,943.98	10,782.48	14,267.52	18,426.51	1,055.26
Cash received (paid)	<u>(8,475.00)</u>	<u>(11,000.00)</u>	<u>(15,000.00)</u>	<u>(18,000.00)</u>	<u>(0.75)</u>
Ending balance	<u>(\$ 531.02)</u>	<u>(\$ 748.54)</u>	<u>(\$1,481.03)</u>	<u>(\$1,054.51)</u>	<u>(\$ 0.00)</u>

Requirement 3:

The most (least) conservative approach for the purposes of income determination is when the discount rate is less (more) than the rate of return on the plan assets. Let us compare the pension under the three scenarios:

Pension Expense under Various Discount Rate Assumptions			
<u>Year</u>	<u>8%</u>	<u>10%</u>	<u>12%</u>
2001	\$ 9,187.87	\$ 8,537.67	\$ 7,943.98
2002	11,795.01	11,275.99	10,782.48
2003	14,717.61	14,496.68	14,267.52
2004	17,869.46	18,165.35	18,426.51
2005	<u>(1,094.21)</u>	<u>0.07</u>	<u>1,055.26</u>
	<u>\$52,475.75</u>	<u>\$52,475.75</u>	<u>\$52,475.75</u>

In the first three years, the pension expense is the highest (lowest) when the discount rate is 8% (12%). However, in the last two years, the situation reverses. However, remarkably, the total expense over the 5-year period is the same regardless of the discount rate assumption. This is because the total expense is determined by only two things: (a) the rate of return earned by the pension plan assets and (b) the actual pension payments to be the employee. (To illustrate this point, we have assumed that the contributions to the pension fund are unaffected by the discount rate assumption used for financial reporting purposes.) For instance, if the pension was completely unfunded, then the total pension expense will equal \$65,000, the cash to be paid to the employee on retirement. If the pension is funded, then the total pension expense will equal the amount of periodic contributions sufficient to generate \$65,000 at the end of year 2005. Of course, the sufficiency of the periodic contributions will be determined by the rate of return by the pension fund. The higher (lower) the rate of return, the smaller (greater) will be the periodic contributions. Since the periodic contributions and the rate of return on pension plan assets are fixed in the problem, the choice of the discount rate cannot affect the total pension expense. To see this, let us examine the total contributions to the pension fund:

	<u>2001</u>	<u>2002</u>	<u>2003</u>	<u>2004</u>	<u>2005</u>	<u>Total</u>
Contributions	\$8,475.00	\$11,000.00	\$15,000.00	\$18,000.00	\$0.75	\$52,475.75

The \$0.75 during 2005 represents the shortfall in the pension fund at the end of 2005. Note that the total contributions to the pension fund equal the total pension expense regardless of the chosen discount rate. If the rate of return had been different, then the final shortfall would have been different, resulting in a different total expense for pensions.

However, one important point is that, although the choice of the discount rate does not affect the total pension expense, it can lead to different allocations of the pension costs to different fiscal years. As discussed earlier, lower (higher) discount rates lead to more (less) conservative income figures.

P14-9. Components of pension liability and pension expense

Requirement 1:

	Projected Benefit Obligation			
	<u>2002</u>	<u>2003</u>	<u>2004</u>	<u>2005</u>
Beginning balance	\$1,000,000	\$1,200,000	\$1,410,000	\$1,631,000
+ Interest cost	100,000	120,000	141,000	163,100
+ Service cost	300,000	350,000	400,000	450,000
- Pension payments	<u>(200,000)</u>	<u>(260,000)</u>	<u>(320,000)</u>	<u>(380,000)</u>
Ending balance	<u>\$1,200,000</u>	<u>\$1,410,000</u>	<u>\$1,631,000</u>	<u>\$1,864,100</u>

	Fair Value of Plan Assets			
	<u>2002</u>	<u>2003</u>	<u>2004</u>	<u>2005</u>
Beginning balance	\$1,000,000	\$1,240,000	\$1,488,000	\$1,646,560
+ Actual return on plan assets	220,000	248,000	178,560	164,656
+ Contributions to pension fund	220,000	260,000	300,000	340,000
- Pension payments	<u>(200,000)</u>	<u>(260,000)</u>	<u>(320,000)</u>	<u>(380,000)</u>
Ending balance	<u>\$1,240,000</u>	<u>\$1,488,000</u>	<u>\$1,646,560</u>	<u>\$1,771,216</u>

In order to examine the changes in unrecognized gain, we have to calculate the net deferral and amortization over the period 2002-2005.

	<u>2002</u>	<u>2003</u>	<u>2004</u>	<u>2005</u>
Actual return on plan assets	\$220,000	\$248,000	\$178,560	\$164,656
- Expected return	<u>(120,000)</u>	<u>(148,800)</u>	<u>(178,560)</u>	<u>(197,587)</u>
Deferral of unrecognized gain/(loss)	<u>\$100,000</u>	<u>\$99,200</u>	<u>\$ -</u>	<u>(\$32,931)</u>
Cumulative deferral (see calculation below)	\$ 100,000	\$ 199,200	\$ 194,160	\$ 158,279
Higher of PBO or fair value of plan assets	1,240,000	1,488,000	1,646,560	1,864,100
Cumulative deferral as a %	8.06%	13.39%	11.79%	8.49%
Cumulative deferral (see calculation below)	100,000	199,200	194,160	158,279
- 10% of the higher of PBO or fair value of plan assets	(124,000)	(148,800)	(164,656)	(186,410)
Deferral in excess of the threshold	-	50,400	29,504	-
Average remaining service period	10	10	10	10
Amortization of the deferred gain in the following year	-	5,040	2,950	-

Note that the deferral in excess of the threshold at the end of year 2003 (2004) is being amortized during 2004 (2005). At the end of 2002, the deferral amount is less than 10% of the higher of PBO and fair value of plan assets.

The balance in cumulative deferral is reconciled as follows:

	Unrecognized Gain			
	<u>2002</u>	<u>2003</u>	<u>2004</u>	<u>2005</u>
Beginning balance	-	\$100,000	\$199,200	\$194,160
+ Excess of actual over expected return	\$100,000	99,200	-	(32,931)
- Amortization of the deferral	<u>-</u>	<u>-</u>	<u>(5,040)</u>	<u>(2,950)</u>
Ending balance	<u>\$100,000</u>	<u>\$199,200</u>	<u>\$194,160</u>	<u>\$158,279</u>

Requirement 2:

The funded status of the plan is provided below:

End of Year	<u>2002</u>	<u>2003</u>	<u>2004</u>	<u>2005</u>
Projected benefit obligation	(\$1,200,000)	(\$1,410,000)	(\$1,631,000)	(\$1,864,100)
Fair value of plan assets	<u>1,240,000</u>	<u>1,488,000</u>	<u>1,646,560</u>	<u>1,771,216</u>
Fair value in excess of PBO	40,000	78,000	15,560	(92,884)
Unrecognized gain	<u>(100,000)</u>	<u>(199,200)</u>	<u>(194,160)</u>	<u>(158,279)</u>
Accrued pension liability	<u>(\$60,000)</u>	<u>(\$121,200)</u>	<u>(\$178,600)</u>	<u>(\$251,163)</u>

Requirement 3:

	<u>2002</u>	<u>2003</u>	<u>2004</u>	<u>2005</u>
Interest cost	\$100,000	\$120,000	\$141,000	\$163,100
Service cost	300,000	350,000	400,000	450,000
- Actual return on plan assets	(220,000)	(248,000)	(178,560)	(164,656)
+ Deferral of unexpected return	100,000	99,200	-	(32,931)
- Amortization of deferral	<u>-</u>	<u>-</u>	<u>(5,040)</u>	<u>(2,950)</u>
Pension expense	<u>\$280,000</u>	<u>\$321,200</u>	<u>\$357,400</u>	<u>\$412,563</u>

Requirement 4:

2002	DR Pension expense	\$280,000	
	CR Accrued pension liability		\$ 60,000
	CR Cash		220,000
2003	DR Pension expense	\$321,200	
	CR Accrued pension liability		\$ 61,200
	CR Cash		260,000
2004	DR Pension expense	\$357,400	
	CR Accrued pension liability		\$ 57,400
	CR Cash		300,000
2005	DR Pension expense	\$412,563	
	CR Accrued pension liability		\$ 72,563
	CR Cash		340,000

Accrued Pension Liability

	<u>2002</u>	<u>2003</u>	<u>2004</u>	<u>2005</u>
Beginning balance	-	\$ 60,000	\$121,200	\$178,600
+ Pension expense	\$280,000	321,200	357,400	412,563
- Contributions to pension fund	<u>(220,000)</u>	<u>(260,000)</u>	<u>(300,000)</u>	<u>(340,000)</u>
Ending balance	<u>\$ 60,000</u>	<u>\$121,200</u>	<u>\$178,600</u>	<u>\$251,163</u>

Note that the ending balances in the accrued pension liability are the same as those reported under the pension funding status reconciliations.

P14-10. Effect of actual vs. expected return on pension funding status and pension expense

Requirement 1:

Stable Economy	Market Value of the Pension Assets			
	<u>2001</u>	<u>2002</u>	<u>2003</u>	<u>2004</u>
End of year				
Rate of return		10.00%	10.00%	10.00%
Plan assets	\$100,000	\$110,000	\$121,000	\$133,100
Income earned during the year		\$10,000	\$11,000	\$12,100

Growth	Market Value of the Pension Assets			
	<u>2001</u>	<u>2002</u>	<u>2003</u>	<u>2004</u>
End of year				
Rate of return		5.00%	10.00%	15.24%
Plan assets	\$100,000	\$105,000	\$115,500	\$133,102
Income earned during the year		\$5,000	\$10,500	\$17,602

Decline	Market Value of the Pension Assets			
	<u>2001</u>	<u>2002</u>	<u>2003</u>	<u>2004</u>
End of year				
Rate of return		15.00%	10.00%	5.22%
Plan assets	\$100,000	\$115,000	\$126,500	\$133,103
Income earned during the year		\$15,000	\$11,500	\$6,603

Income earned for a year is calculated by multiplying the market value of plan assets at the end of the previous year by the rate of return of the current year. The year-end market value of plan assets is the sum of the market value of the plan assets at the end of the previous year plus the income earned during the year.

Regardless of the assumed state of the economy, the pension fund will have assets worth approximately \$133,100 at the end of year 2004. This implies that the pension funds must have earned the same annualized rates of return over the 3-year period under all states of the economy. However, in a given year, the realized rate of return in one scenario may be different from those for the other scenarios. However, on average, the rates of return are the same, or, in other words, we expect the pension fund to earn a fixed annualized rate of return in the long run.

Requirement 2:

Stable Economy	<u>2002</u>	<u>2003</u>	<u>2004</u>	<u>Total</u>
Interest cost	\$10,000	\$11,000	\$12,100	\$33,100
- Return on plan assets	<u>(10,000)</u>	<u>(11,000)</u>	<u>(12,100)</u>	<u>(33,100)</u>
Pension expense	<u>\$ -</u>	<u>\$ -</u>	<u>\$ -</u>	<u>\$ -</u>

Note that there is no service cost since the company has canceled the pension plan as of December 31, 2001. Consequently, only interest cost and return on plan assets are relevant in this problem.

Under this scenario, the market value of the pension plan assets and the projected benefit obligation are identical at every point in time. This is because the realized rates of return (which determines the value of plan assets) equal the expected rates of return (which determines the PBO and the interest cost) in every period. In the other two scenarios, while the expected rate of return continues to be the same, the realized returns vary from year to year. Consequently, while the interest cost will be the same in all three scenarios, the return on plan assets will differ from year to year.

Growing Economy	<u>2002</u>	<u>2003</u>	<u>2004</u>	<u>Total</u>
Interest cost	\$10,000	\$11,000	\$12,100	\$33,100
- Return on plan assets	<u>(5,000)</u>	<u>(10,500)</u>	<u>(17,602)</u>	<u>(33,102)</u>
Pension expense	<u>\$5,000</u>	<u>\$500</u>	<u>\$(5,502)</u>	<u>\$(2)</u>

Declining Economy	<u>2002</u>	<u>2003</u>	<u>2004</u>	<u>Total</u>
Interest cost	\$10,000	\$11,000	\$12,100	\$33,100
- Return on plan assets	<u>(15,000)</u>	<u>(11,500)</u>	<u>(6,603)</u>	<u>(33,103)</u>
Pension expense	<u>\$(5,000)</u>	<u>\$(500)</u>	<u>\$5,497</u>	<u>\$(3)</u>

The total pension expense over the period 2002-2004 is the same figure regardless of the realized rates of return. This is because, as discussed in answer to Requirement 1, the annualized rates of return are the same under the three scenarios even though they differ from year to year. Consequently, depending on whether the realized return in a given year is greater or less than the expected return, the pension expense will be lower or higher.

Note: We will ignore the small difference between realized rates of return and the expected rate of return in the declining and growing economy scenarios. This is due to the fact that realized rates of return are rounded off to two decimal points, resulting in a small credit to the total pension expense (2 or 3 dollars). To simplify discussions, we will assume that the total expense is zero in all three scenarios.

Requirement 3:

Since there is no net amortization or deferral under the “Stable Economy” scenario, the calculations for pension expense are similar to those reported in Requirement 2.

Stable Economy	2002	2003	2004	Total
Interest cost	\$10,000	\$11,000	\$12,100	\$33,100
- Return on plan assets	<u>(10,000)</u>	<u>(11,000)</u>	<u>(12,100)</u>	<u>(33,100)</u>
Pension expense	<u>\$ -</u>	<u>\$ -</u>	<u>\$ -</u>	<u>\$ -</u>

The funded status of the pension plan is:

Stable Economy	2002	2003	2004
Projected benefit obligation	(\$110,000)	(\$121,000)	(\$133,100)
Fair value of plan assets	<u>110,000</u>	<u>121,000</u>	<u>133,100</u>
Accrued pension liability	<u>\$ -</u>	<u>\$ -</u>	<u>\$ -</u>

However, under the other two scenarios, there will be net deferral of unrecognized gains or losses, and consequently, the calculations for pension expense will differ from those in Requirement 2.

Declining Economy	2002	2003	2004	Total
Interest cost	\$10,000	\$11,000	\$12,100	\$33,100
- Return on plan assets	(15,000)	(11,500)	(6,603)	(33,103)
Net amortization and deferral	<u>5,000</u>	<u>500</u>	<u>(5,497)</u>	<u>3</u>
Pension expense	<u>\$ -</u>	<u>\$ -</u>	<u>\$ -</u>	<u>\$ -</u>

Declining Economy	2002	2003	2004
Projected benefit obligation	(\$110,000)	(\$121,000)	(\$133,100)
Fair value of plan assets	<u>115,000</u>	<u>126,500</u>	<u>133,103</u>
Plan assets (-) PBO	5,000	5,500	3
Unrecognized gain	<u>(5,000)</u>	<u>(5,500)</u>	<u>(3)</u>
Accrued pension liability	<u>\$ -</u>	<u>\$ -</u>	<u>\$ -</u>

Higher of PBO or fair value	\$115,000	\$126,500	\$133,103
Unrecognized gain as a %	4.35%	4.35%	0.00%

Growing Economy	2002	2003	2004	Total
Interest cost	\$10,000	\$11,000	\$12,100	\$33,100
- Return on plan assets	(5,000)	(10,500)	(17,602)	(33,102)
Net amortization and deferral	<u>(5,000)</u>	<u>(500)</u>	<u>5,502</u>	<u>2</u>
Pension expense	<u>\$ -</u>	<u>\$ -</u>	<u>\$ -</u>	<u>\$ -</u>

Growing Economy	2002	2003	2004
Projected benefit obligation	(\$110,000)	(\$121,000)	(\$133,100)
Fair value of plan assets	<u>105,000</u>	<u>115,500</u>	<u>133,102</u>
Plan assets (-) PBO	(5,000)	5,500)	2
Unrecognized loss	<u>5,000</u>	<u>5,500</u>	<u>(2)</u>
Accrued pension liability	<u>\$ -</u>	<u>\$ -</u>	<u>\$ -</u>

Higher of PBO or fair value	110,000	121,000	133,102
Unrecognized gain as a %	4.55%	4.55%	0.00%

Note: There is no need for amortizing the unrecognized gain or loss since it is well within the 10% threshold.

Requirement 4:

The answer to Requirement 2 shows that when net deferral and amortization of unrecognized loss or gain is ignored then pension expense may be highly volatile depending on the deviation of the realized rate of return and the expected rate of return in a given year. It is reasonable to argue that these deviations are typically beyond the control of either the pension fund manager or the management of the company that is offering the pension plan. Consequently, as long as the company has a sound estimate for the expected rate of return of the plan assets, ignoring the year-to-year difference between expected and realized rates of return provides meaningful estimates for the "true" pension cost. Even from a financial analyst's standpoint, the smoothing effects of net amortization and deferral are likely to improve his or her ability to forecast the future earnings.

P14-11. Components of OPEB and journal entries

Requirement 1:

Determining missing costs and net periodic benefit cost

	1999	1998
Service cost (per change in benefit obligation schedule)	<u>\$ 41,000</u>	<u>\$ 38,000</u>
Interest cost (per change in benefit obligation schedule)	<u>\$ 82,000</u>	<u>\$ 78,000</u>
Plan assets at beginning of year	\$ 865,000	\$ 767,000
Assumed expected rate of return	8.8%	9.0%
Expected return on plan assets	<u>76,120</u>	<u>69,030</u>
Rounded to nearest million	<u>\$ 76,000</u>	<u>\$ 69,000</u>

Other Postretirement Benefit Costs		
(In thousands)	1999	1998
Service cost	\$ 41,000	\$ 38,000
Interest cost on accumulated benefit obligation	82,000	78,000
Expected return on plan assets	(76,000)	(69,000)
Amortization of transition obligation	22,000	22,000
Amortization of prior service costs	4,000	4,000
Recognized gain	(14,000)	(14,000)
Severance plan costs	1,000	6,000
Curtailment loss	35,000	0
Net periodic benefit cost	<u>\$ 95,000</u>	<u>\$ 65,000</u>

Requirement 2:

Journal entry

DR Net periodic benefit cost (OPEB expense)	95,000
CR Cash (employer contribution)	24,000
CR Accrued (OPEB) liability for benefits	71,000

Requirement 3:

Balance sheet presentation

Unicom would reflect a long-term liability on its balance sheet in the amount of \$442,000. This amount is probably combined with additional liabilities and reported under the caption of "Other."

The \$442,000 can be determined as follows:

Accrued liability at 12/31/98	\$371,000
Journal entry to record 1999 OBEB liability (Requirement 2)	<u>71,000</u>
Accrued liability at 12/31/99	<u>\$442,000</u>

P14-12. Amortization of actuarial gains (losses) and minimum pension liability

Requirement 1:

Year (1)	Beginning of the Year					For the Year		End of the Year	
	Projected Benefit Obligation (2)	Fair Value of Pension Plan Assets (3)	Higher of (2) or (3) (4)	Corridor 10% of (4) (5)	Cumulative Unrecognized Gain (Loss) (6)	Excess of (6) over (5) (7)	Amortized Gain (loss) (8)	Excess Gain (loss) (9)	Cumulative Unrecognized Gain (Loss) (6) - (8) + (9)
2003	\$450,000	\$410,000	\$450,000	\$45,000	(\$70,000)	(\$25,000)	(\$5,000)	(\$60,000)	(\$125,000)
2004	570,000	500,000	570,000	57,000	(125,000)	(68,000)	(13,600)	(120,000)	(231,400)
2005	840,000	800,000	840,000	84,000	(231,400)	(147,400)	(29,480)	120,000	(81,920)
2006	1,000,000	1,100,000	1,100,000	110,000	(81,920)	-	-	175,000	93,080
2007	1,200,000	1,280,000	1,280,000	128,000	93,080	-	-	250,000	343,080
2008	1,450,000	1,310,000	1,450,000	145,000	343,080	198,080	39,616	80,000	383,464

Note that column (5) is unsigned in the sense that the magnitude of the cumulative unrecognized gain or loss should exceed the corridor before the amortization begins. Consequently, in calculating the excess of (6) over (5) [i.e., column (7)], column (5) is subtracted from column (6) when column (6) is positive. In contrast, column (5) is added to column (6) when column (6) is negative.

Column (8) shows how much of the cumulative unrecognized gain (loss) is amortized during a given year. Amortization of gains decrease pension expense (year 2007), whereas amortization of losses increase pension expense (years 2003–2005).

Requirement 2:

End of Year	<u>2002</u>	<u>2003</u>	<u>2004</u>	<u>2005</u>	<u>2006</u>	<u>2007</u>
Projected benefit obligation	(\$450,000)	(\$570,000)	(\$840,000)	(\$1,000,000)	(\$1,200,000)	(\$1,450,000)
Fair value of plan assets	<u>410,000</u>	<u>500,000</u>	<u>800,000</u>	<u>1,100,000</u>	<u>1,280,000</u>	<u>1,310,000</u>
Excess of fair value over PBO	(40,000)	(70,000)	(40,000)	100,000	80,000	(140,000)
Unrecognized loss (gain)	<u>70,000</u>	<u>125,000</u>	<u>231,400</u>	<u>81,920</u>	<u>(93,080)</u>	<u>(343,080)</u>
Accrued pension asset (liability)	<u>\$30,000</u>	<u>\$55,000</u>	<u>\$191,400</u>	<u>\$181,920</u>	<u>(\$13,080)</u>	<u>(\$483,080)</u>

Requirement 3:

Beginning of the year values				
Year	Projected Benefit Obligation	Fair Value of Pension Plan Assets	Accumulated Benefit Obligation	Minimum Pension Liability
(1)	(2)	(3)	(5)	(6)
2002	\$400,000	\$390,000	\$380,000	-
2003	450,000	410,000	427,500	\$17,500
2004	570,000	500,000	541,500	41,500
2005	840,000	800,000	798,000	-
2006	1,000,000	1,100,000	950,000	-
2007	1,200,000	1,280,000	1,140,000	-
2008	1,450,000	1,310,000	1,377,500	67,500

First, we calculate the ABOs as 95% of the PBOs. The minimum pension liability is the excess of the ABO over the fair value of the pension assets.

End of Year	2002	2003	2004	2005	2006	2007
Projected benefit obligation	(\$450,000)	(\$570,000)	(\$840,000)	(\$1,000,000)	(\$1,200,000)	(\$1,450,000)
Fair value of plan assets	<u>410,000</u>	<u>500,000</u>	<u>800,000</u>	<u>1,100,000</u>	<u>1,280,000</u>	<u>1,310,000</u>
Excess of fair value over PBO	(40,000)	(70,000)	(40,000)	100,000	80,000	(140,000)
Unrecognized loss (gain)	70,000	125,000	231,400	81,920	(93,080)	(343,080)
Adjustment to recognize minimum liability	<u>(47,500)</u>	<u>(96,500)</u>	-	-	-	-
Accrued pension asset (liability)	<u>(\$17,500)</u>	<u>(\$41,500)</u>	<u>\$191,400</u>	<u>\$181,920</u>	<u>(\$13,080)</u>	<u>(\$483,080)</u>

Note that the schedule for the funded status is based on end of year values. (The beginning of year values for 2003 in the previous table are the end of the year values for 2002 in the current table.)

The adjustment for minimum liability is required only during the first two years. The last year liability is already more than the minimum pension liability.

2002	DR Intangible asset	\$47,500	
	CR Accrued pension liability		\$47,500
2003	DR Intangible asset	\$49,000	
	CR Accrued pension liability		\$49,000
2004	DR Accrued pension liability	\$96,500	
	CR Intangible asset		\$96,500

P14-13. Pension expense and funded status

Requirement 1:

For the Years Ended

	<u>2002</u>	<u>2003</u>
Service cost	\$125,000	\$145,000
Interest cost	90,000	110,500
- Actual return on plan assets	(100,000)	(64,740)
+/- Deferral of unrecognized gain/loss	10,000	(53,950)
+ Amortization of prior service cost	-	11,000
Annual pension expense	<u>\$125,000</u>	<u>\$147,810</u>

Schedules showing the activities in the components that comprise the funded status are provided below:

Projected Benefit Obligation

	<u>2002</u>	<u>2003</u>
Beginning of the year	\$900,000	\$1,105,000
Service cost	125,000	145,000
Interest cost	90,000	110,500
+ Prior service cost from plan enhancements	110,000	-
- Pension payments	(120,000)	(85,000)
End of the year	<u>\$1,105,000</u>	<u>\$1,275,500</u>

Fair Value of Plan Assets

	<u>2002</u>	<u>2003</u>
Beginning of the year	\$1,000,000	\$1,079,000
Actual rate of return	100,000	64,740
+ Contributions to pension fund	99,000	123,000
- Pension payments	(120,000)	(85,000)
End of the year	<u>\$1,079,000</u>	<u>\$1,181,740</u>

Unrecognized Prior Service Cost

	<u>2002</u>	<u>2003</u>
Beginning of the year	-	\$110,000
+ Prior service cost from plan enhancements	\$110,000	-
- Amortization during the year	-	(11,000)
End of the year	<u>\$110,000</u>	<u>\$ 99,000</u>

Unrecognized Gain (Loss)

	<u>2002</u>	<u>2003</u>
Beginning of the year	-	\$ 10,000
+ Actual returns in excess of expected returns	\$ 10,000	(53,950)
End of the year	<u>\$ 10,000</u>	<u>\$ 43,950</u>

Since the unrecognized gain at the end of 2002 is well within the corridor, it is not amortized during the year 2003.

Based on the above schedules, the funded status reconciliation is provided below:

As of 12/31	<u>2001</u>	<u>2002</u>	<u>2003</u>
Projected benefit obligation	(\$900,000)	(\$1,105,000)	(\$1,275,500)
(-) Fair value of plan assets	<u>1,000,000</u>	<u>1,079,000</u>	<u>1,181,740</u>
Fair value in excess of PBO	100,000	(26,000)	(93,760)
Unrecognized prior service cost		110,000	99,000
Unrecognized (gain) loss		<u>(10,000)</u>	<u>43,950</u>
Accrued pension asset (liability)	<u>\$100,000</u>	<u>\$ 74,000</u>	<u>\$ 49,190</u>

Requirement 2:

2002 DR Pension expense	\$125,000	
CR Accrued pension asset		\$ 26,000
CR Cash		99,000
2003 DR Pension expense	\$147,810	
CR Accrued pension asset		\$ 24,810
CR Cash		123,000

Since the company is in the consulting business, it is assumed that all of the pension cost is expensed as a period cost.

Accrued Pension Asset	<u>2002</u>	<u>2003</u>
Beginning of the year	\$100,000	\$ 74,000
- Pension expense for the year	(125,000)	(147,810)
+ Contributions to pension plan	<u>99,000</u>	<u>123,000</u>
End of the year	<u>\$ 74,000</u>	<u>\$ 49,190</u>

Requirement 3:

Recall the funded status reconciliation provided earlier:

As of 12/31	<u>2001</u>	<u>2002</u>	<u>2003</u>
Projected benefit obligation	(\$900,000)	(\$1,105,000)	(\$1,275,500)
- Fair value of plan assets	<u>1,000,000</u>	<u>1,079,000</u>	<u>1,181,740</u>
Fair value in excess of PBO	100,000	(26,000)	(93,760)
Unrecognized prior service cost		110,000	99,000
Unrecognized (gain) loss		<u>(10,000)</u>	<u>43,950</u>
Accrued pension asset (liability)	<u>\$100,000</u>	<u>\$ 74,000</u>	<u>\$ 49,190</u>

At the end of 2001, the fair value of the pension plan assets is more than the projected benefit obligations. The situation reverses at the end of 2002 due to

the retroactive enhancement of benefits. Thus, while the pension is overfunded at the end of 2001, it is slightly underfunded at the end of 2002 and 2003. However, for financial reporting purposes, the company continues to show accrued pension asset (i.e., “overfunded” plan).

The main item causing the difference between the two is from the unrecognized prior service costs. By retroactively enhancing the benefits, the economic balance sheet of the pension fund deteriorated immediately (i.e., fair value is less than the PBO). However, this economic obligation will be gradually recognized in the financial reporting balance sheet over a 10-year period by amortizing the enhanced benefits as part of the pension expense. Consequently, until all of the enhanced benefits are reflected in the accrued pension liability, one might consider the difference between the economic obligation and the accrued pension asset as an off-balance-sheet liability.

P14-14. Solving for pension cost and funded status components

Requirement 1:

	<u>2002</u>	<u>2003</u>
For the Years Ended		
Service cost	\$110,000	\$130,000
Interest cost	44,000	54,720
- Actual return on plan assets	(55,000)	(71,400)
+/- Deferral of unrecognized gain/loss	-	11,900
+ Amortization of prior service cost	-	16,000
Annual pension cost	<u>\$ 99,000</u>	<u>\$141,220</u>

Calculations for 2002: Interest cost = $\$550,000 \times 0.08$; actual return on plan assets = $\$550,000 \times 0.10$. Since the actual return was equal to the expected return, there is no deferral during 2002.

Calculations for 2003: Interest cost = $\$684,000 \times 0.08$; actual return on plan assets = $\$595,000 \times 0.12$. Since the actual return was greater than the expected return by $\$11,900$ [$\$71,400 - (\$595,000 \times 0.10)$], the excess return results in an unrecognized gain during the year 2003 (which increases the pension cost).

Using the information on annual pension cost, we can break down the total pension cost between manufacturing and administrative employees:

Breakdown of the Annual Pension Cost	<u>2002</u>	<u>2003</u>
Manufacturing employees	\$ 63,000	\$ 85,000
Administrative employees (plug number)	<u>36,000</u>	<u>56,220</u>
Annual pension cost (from the above schedule)	<u>\$ 99,000</u>	<u>\$141,220</u>

Requirement 2:

Before we prepare the schedule for PBO, we have to calculate the change in the PBO from retroactive provision of benefits from plan enhancements. Recall that the answer to Requirement 1 indicates that the amortization of prior service cost was \$16,000 during 2003 (the first year of amortization). The problem states that “the average remaining service period of employees expected to receive these retroactive benefits under the plan was 5 years.” This must mean that the change in the PBO from plan enhancements was \$80,000 ($5 \times \$16,000$).

Projected Benefit Obligation	<u>2002</u>	<u>2003</u>
Beginning of the year	\$550,000	\$684,000
Service cost	110,000	130,000
Interest cost	44,000	54,720
+ Prior service cost from plan enhancements	80,000	-
- Pension payments (plug number)	<u>(100,000)</u>	<u>(100,000)</u>
End of the year	<u>\$684,000</u>	<u>\$768,720</u>

Except for pension payments made during the years, we have all the other information. Consequently, the payouts from the pension plan to the employees are plug numbers.

Fair Value of Plan Assets	<u>2002</u>	<u>2003</u>
Beginning of the year	\$550,000	\$595,000
Actual rate of return	55,000	71,400
+ Contributions to pension fund (plug number)	90,000	120,000
- Pension payments (from the PBO schedule)	<u>(100,000)</u>	<u>(100,000)</u>
End of the year	<u>\$595,000</u>	<u>\$686,400</u>

In preparing the schedule for fair value of plan assets, we use the pension payments information from the PBO schedule with the plug number being the contributions made by the company to the pension plan.

The schedules for unrecognized prior service cost and unrecognized gain are straightforward.

Unrecognized Prior Service Cost	<u>2002</u>	<u>2003</u>
Beginning of the year	-	\$80,000
+ Prior service cost from plan enhancements	\$80,000	-
- Amortization during the year	<u>-</u>	<u>(16,000)</u>
End of the year	<u>\$80,000</u>	<u>\$64,000</u>

Unrecognized gain	<u>2002</u>	<u>2003</u>
Beginning of the year	-	-
+ Actual returns in excess of expected returns	-	\$11,900
End of the year	-	<u>\$11,900</u>

Requirement 3:

2002	DR Work-in-process inventory	\$63,000	
	DR Pension expense	36,000	
	CR Accrued pension liability		\$ 99,000
	DR Accrued pension liability	\$90,000	
	CR Cash		\$ 90,000
2003	DR Work-in-process inventory	\$85,000	
	DR Pension expense	56,220	
	CR Accrued pension liability		\$141,220
	DR Accrued pension liability	\$120,000	
	CR Cash		\$120,000

The year-end balances for the accrued pension liability can be compared with the schedule on the funded status as a check on our journal entries:

Accrued Pension Liability	<u>2002</u>	<u>2003</u>
Beginning of the year	-	\$ 9,000
+ Pension cost for the year	\$99,000	141,220
- Contributions to pension plan	<u>(90,000)</u>	<u>(120,000)</u>
End of the year	<u>\$ 9,000</u>	<u>\$ 30,220</u>

Funded Status Reconciliation

	December 31	
	<u>2002</u>	<u>2003</u>
Projected benefit obligation	\$684,000	\$768,720
Fair value of plan assets	<u>(595,000)</u>	<u>686,400</u>
Net unfunded obligation	89,000	82,320
- Unrecognized prior service costs	(80,000)	(64,000)
+ Unrecognized gain	-	11,900
Accrued pension obligation	<u>\$ 9,000</u>	<u>\$ 30,220</u>

P14-15. OPEB expense and journal entries

Requirement 1:

Service cost	\$210,000
Interest cost	175,000
Amortization of transition obligation	<u>100,000</u>
OPEB expense	<u>\$485,000</u>

Accumulated Benefit Obligation

Beginning of the year	\$2,000,000
Service cost	210,000
Interest cost	175,000
- Benefit payments	<u>(245,000)</u>
End of the year	<u>\$2,140,000</u>

Unrecognized Transition Obligation

Beginning of the year	\$2,000,000
- Amortization during the year	<u>(100,000)</u>
End of the year	<u>\$1,900,000</u>

Accumulated benefit obligation	\$2,140,000
- Unrecognized transition obligation	<u>(1,900,000)</u>
Accrued OPEB obligation	<u>\$ 240,000</u>

Requirement 2:

DR Accrued OPEB expense	\$485,000	
CR Accrued OPEB obligation		\$240,000
CR Cash		245,000

Requirement 3:

Service cost	\$210,000
Interest cost	<u>175,000</u>
OPEB expense	<u>\$385,000</u>

Accumulated Benefit Obligation

Beginning of the year	\$2,000,000
Service cost	210,000
Interest cost	175,000
- Benefit payments	<u>(245,000)</u>
End of the year	<u>\$2,140,000</u>

Since there is no unrecognized transition obligation, the accumulated benefit obligation will equal the accrued OPEB liability.

DR Cumulative effects of accounting change	\$1,300,000	
DR Deferred income taxes	700,000	
CR Accrued OPEB obligation		\$2,000,000
DR Accrued OPEB expense	\$ 385,000	
CR Accrued OPEB obligation		\$ 140,000
CR Cash		245,000

If the transition amount is recognized immediately it appears below continuing operations "below the line" as an accounting change reduction in income. Whereas, if it is amortized as part of pension expense, it appears in continuing operations "above the line" and reduces income from operations \$100,000 every year for the next twenty years. Thus, a number of firms that had a large enough retained earning balance to absorb the equity hit voluntarily chose to take the "big bath" when they initially adopted SFAS 106. For example, Deere and Company reduced net income by roughly one billion dollars, instantaneously eliminated approximately one billion of the two billion dollar retained earnings balance, and put one billion dollars of OPEB liabilities on their balance sheet in fiscal year 1993 when it adopted SFAS 106.

P14-16. Reconciling accumulated postretirement benefit obligations and preparing journal entries

Requirement 1:

Funded Status of Plans		Recognized/Unrecognized Amounts	
Accumulated postretirement		Recognized Amount	
Benefit obligation (APBO)	\$ 21,743,000	Accrued cost (OPEB liability)	\$ 9,865,000
Plan assets at fair value	0	Unrecognized Amounts	
		Unrecognized transaction obligation	12,577,000
		Unrecognized net gain (loss)	(699,000)
APBO in excess of plan assets	<u>\$ 21,743,000</u>	APBO in excess of plan assets	<u>\$ 21,743,000</u>

Requirement 2:

Journal entry:

DR OPEB Expense	\$2,809,000	
CR Cash		\$1,155,000
CR Accrued OPEB liability		1,654,000

Requirement 3:

APBO Reconciliation

APBO at June 30, 1998	\$ 20,494,000
• Service cost	467,000
• Interest cost	1,444,000
• Unrecognized losses during the period (plug) *	<u>(1,155,000)</u>
APBO at June 30, 1999	<u>\$ 21,743,000</u>

* There was not any Amortization of the Unrecognized Net Gain during fiscal year 1999. Therefore, the \$493,000 reduction in the Unrecognized Net Gain (i.e., \$1,192,000 - \$699,000) is probably the result of lowering the assumed discount rate to 7.0% in 1999 (1998 rate was 7.25%). Everything else remaining the same, when the discount rate decreases the present value of the APBO will increase.

Requirement 4:

The OPEB expense would have been the cash outflow of \$1,155,000.

Requirement 5:

Reconciliation of Accrued OPEB Liability

Balance at June 30, 1998	\$ 8,211,000
Plus 1999 OPEB expense	2,809,000
Less 1999 Benefit payments	<u>(1,155,000)</u>
Balance at June 30, 1999	<u>\$ 9,865,000</u>

Financial Reporting and Analysis

Chapter 14 Solutions

Pensions and Postretirement Benefits Cases

Cases

C14-1. E.I. Baer Company: OPEB reconciliation of funded status and expense components

Requirement 1:

<u>Funded Status of Plans</u>		<u>Recognized/Unrecognized Amounts</u>	
		Recognized amount	
Accumulated postretirement benefit obligation	\$15,894	Accrued postretirement benefit obligation	\$23,290
Plan assets	-0-	Unrecognized amounts	
		Unrecognized net gain	(5,082)
		Prior service cost (plan curtailments)	(2,314)
Accumulated postretirement benefit obligation in excess of plan assets	<u>\$15,894</u>	Accumulated postretirement benefit obligation in excess of plan assets	<u>\$15,894</u>

Requirement 2:

Since there were no plan amendments during the periods, the year-to-year change in prior service costs must be due to amortization. Accordingly, amortization can be determined as follows:

(\$ in thousands)

Prior Service Costs	<u>1999</u>	<u>1998</u>	<u>1997</u>
Beginning of the year	\$ 3,070	\$ 3,826	\$ 4,582
End of the year	<u>2,314</u>	<u>3,070</u>	<u>3,826</u>
Amortization	<u>\$ 756</u>	<u>\$ 756</u>	<u>\$ 756</u>

The net periodic OPEB cost schedule for 1997, 1998 and 1999 can now be developed using the information given in the problem statement and the prior service cost amortization computed above. The recognized net actuarial gain is a plugged number.

(\$ in thousands)

Net Periodic OPEB Cost

For the Years Ended

	<u>1999</u>	<u>1998</u>	<u>1997</u>
Service cost	\$ 681	\$ 642	\$ 998
Interest cost	1,140	1,113	1,199
Amortization of prior service costs	(756)	(756)	(756)
Recognized net actuarial gain (Plug number)	<u>(182)</u>	<u>(208)</u>	<u>(133)</u>
Net periodic OPEB cost	<u><u>\$ 883</u></u>	<u><u>\$ 791</u></u>	<u><u>\$ 1,308</u></u>

Requirement 3:

Before we can prepare a schedule rolling forward the APBO from 1997 to 1999 we need to know either the actuarial losses / (gains) or the amount of benefits paid. Since we determined the recognized net actuarial losses in Requirement 2, we should be able to calculate the related actuarial loss or gain.

(\$ in thousands)

Actuarial (losses) gains

	<u>1999</u>	<u>1998</u>	<u>1997</u>
Beginning of year unrecognized gain (Given)	\$ 3,477	\$ 2,789	\$ 3,913
Actuarial (losses) gains (Plug number)	1,787	896	(991)
Recognized net gain (per Requirement 1)	<u>(182)</u>	<u>(208)</u>	<u>(133)</u>
End of year unrecognized gain (Given)	<u><u>\$ 5,082</u></u>	<u><u>\$ 3,477</u></u>	<u><u>\$ 2,789</u></u>

Determining the actuarial gains (losses) allows completion of the schedule rolling the APBO forward from the beginning of 1997 to the end of 1999. The only unknown is the *benefits paid* during each period. This amount will be a **plugged number** in the schedule.

Accumulated Postretirement

Benefit Obligation	<u>1999</u>	<u>1998</u>	<u>1997</u>
APBO at beginning of year	\$ 16,675	\$ 17,815	\$ 15,502
Service cost	681	642	998
Interest cost	1,140	1,113	1,199
Actuarial losses (gains)	(1,787)	(896)	991
Benefits paid (Plug number)	<u>(815)</u>	<u>(1,999)</u>	<u>(875)</u>
APBO at end of year	<u><u>\$ 15,894</u></u>	<u><u>\$ 16,675</u></u>	<u><u>\$ 17,815</u></u>

Requirement 4:

1997 DR OPEB Expense	\$1,308	
CR Accrued OPEB Liability		\$433
CR Cash		875
1998 DR OPEB Expense	\$ 791	
DR Accrued OPEB Liability	1,208	
CR Cash		\$1,999
1999 DR OPEB Expense	\$883	
CR Accrued OPEB Liability		\$ 68
CR Cash		815

(\$ in thousands)

Accrued OPEB Liability	1999	1998	1997
Beginning of year balance	\$ 23,222	\$ 24,430	\$ 23,997
Net periodic OPEB cost (OPEB expense)	883	791	1,308
Less payments	(815)	(1,999)	(875)
End of year balance	<u>\$ 23,290</u>	<u>\$ 23,222</u>	<u>\$ 24,430</u>

Requirement 5:

To answer this requirement, examine the schedule for the ABO:

(\$ in thousands)

Accumulated Postretirement Benefit Obligation	1999	1998	1997
APBO at beginning of year	\$ 16,675	\$ 17,815	\$ 15,502
Service cost	681	642	998
Interest cost	1,140	1,113	1,199
Actuarial losses (gains)	(1,787)	(896)	991
Benefits paid (Plug number)	(815)	(1,999)	(875)
APBO at end of year	<u>\$ 15,894</u>	<u>\$ 16,675</u>	<u>\$ 17,815</u>

The bolded numbers show the effect of changes in assumptions on the APBO. During 1998 and 1999, the changes in assumptions resulted in an actuarial gain, decreasing the APBO, while in 1997 they resulted in an actuarial loss and increased the APBO.

To better understand the reasons for the changes in APBO, let us focus on the assumptions made by the company:

	End of Years			
	1999	1998	1997	1996
Discount rate	7.50%	7.25%	7.25%	7.50%
Health-care cost trend rate (near-term)	6.5 - 7.0%	7.0 - 8.5%	8.0 - 9.5%	8.5 - 10%

From 1996 to 1997, the company made two changes that affected the value of APBO in opposite directions. Decreasing the discount rate from 7.5% to 7.25% would have increased the APBO. In contrast, decreasing the health care cost trend rate from 8.5-10.0% to 8.0-9.5% would have decreased the APBO. The two offsetting effects resulted in an actuarial loss, which increased the APBO by \$991,000.

From 1997 to 1998, the company changed the range for the health care cost trend rate from 8-9.5% to 7-8.5%, while holding the discount rate constant. Decreasing the cost trend rate resulted in an actuarial gain, which decreases the APBO by \$896,000.

From 1998 to 1999, the company made two changes, which affected the value of APBO in the same direction. Increasing the discount rate from 7.25% to 7.5% would have decreased the APBO. In addition, decreasing the health care cost trend rate from 7-8.5% to 6.5-7% would also have decreased the APBO. As expected, the company experienced an actuarial gain that decreased the APBO by \$1,787,000.

C14-2. Aeromed Corporation: Interpreting pension footnote disclosures

Requirement 1:

Prepaid pension cost decreased \$77 million (from \$155 to \$78 million). This implies that funding was less than the net periodic pension cost of \$177 million (given). Therefore, the amount of cash contributed into the fund was \$100 million. The required journal entry (in millions) is:

DR Pension expense (net periodic pension cost)	177
CR Prepaid pension cost	77
CR Cash	100

Requirement 2:

In order to determine benefit payments we need to know the following information:

(\$ in millions)

Fair value of plan assets at January 1, 1999 (Given)	\$ 5,564
Actual return on plan assets (Given)	\$ 7
Employer contributions (Requirement 1)	\$ 100
Fair value of plan assets at December 31, 1999	Unknown

We can determine the fair value of plan assets at December 31, 1999 by examining the plans' funded status. It shows a PBO of \$5,624 million and that the plan was underfunded by \$341 million. Accordingly, the fair value of plan assets at December 31 1999 is \$5,283 million (\$5,624 – \$341 million).

Utilizing a T account, the benefits paid to retirees in 1999 can be easily computed as **\$388 million**.

	(\$ in millions)	
	Fair value of plan assets	
Balance January 1	5,564	
Actual return on plan assets	7	
Employer contributions	100	
		X
Balance December 31	5,283	
		\$ 388

$X = 5,564 + 7 + 100 - 5,283$ or, \$ 388

Requirement 3:

We know that plan amendment changes will increase or decrease prior service costs. Accordingly, the easiest way to compute the effect of plan amendments on the PBO is to reconcile prior service cost from 1998 to 1999.

Unrecognized Prior Service Cost

(\$ in millions)

	1999
Balance January 1 (given - Funded status table)	\$ 68
Amortization (given - Components of net periodic pension cost table)	(5)
Plan amendments -- Plug number	75
Balance December 31 (given - Funded status table)	<u><u>\$ 138</u></u>

Plan amendments increased the PBO by \$75 million dollars during 1999.

Requirement 4:

The easiest way to determine the impact of actuarial gains or losses on the PBO is to reconcile the unrecognized loss at December 31, 1998 to the balance at December 31, 1999. All the information is given except the unexpected loss, which can be readily determined from the given information. The actuarial loss or gain becomes a plug number in the reconciliation.

Unrecognized Loss (\$ in millions)	1999
Balance January 1 (given - Funded status table)	651
Unexpected loss (Expected return of \$514 vs. actual return of \$7 (\$514 - \$7))	507
Amortization (given - Components of net periodic pension cost table)	(21)
Actuarial gain -- Plug number	(849)
Balance December 31 (given - Funded status table)	<u><u>\$ 288</u></u>

The actuarial gain decreases the PBO by \$849 million.

Requirement 5:

From 1998 to 1999 the company increased the discount rate from 7.00% to 8.25%. Increasing the discount rate would cause the firm to experience an actuarial gain, which in turn would lower the PBO. This is consistent with the answer to Requirement 4.

Requirement 6:

Funded status of the plan:

(\$ in millions)				
<u>Funded Status of Plans</u>			<u>Recognized / Unrecognized Amounts</u>	
Projected benefit obligation	\$ (5,624)	CR	Recognized amounts	
Plan assets at Fair Value	5,283	DR	1. Prepaid benefit cost included in consolidated balance sheet	\$ 78 DR
			Unrecognized amounts	
			2. Unrecognized net loss	(288) CR
			3. Unrecognized prior service costs	(138) CR
			4. Unrecognized transition asset	7 DR
Plan assets less than projected benefit obligation	<u><u>\$ (341)</u></u>	CR	Plan assets less than projected benefit obligation	<u><u>\$ (341)</u></u> CR

C14-3. Shileny & Cribbs, Inc.: Interpreting pension footnote disclosures

Requirement 1:

The required journal entry (in thousands) to record 1999 pension expense is:

DR Pension expense	1,274	
CR Prepaid benefit cost		1,274

Note that the decrease from 1998 to 1999 in the prepaid benefit cost (from the Fair Value of Plan Assets table) is \$1,274. This decrease in the prepaid cost indicates that no funding occurred in 1999.

The \$917 thousand increase in pension expense is primarily the result of an \$816 thousand increase in service cost from the 1998 period. The company's footnote disclosure does not address this increase. However, the company's Form 10-K filing for 1999 indicates the firm had 2,162 employees. The Form 10-K for 1998 indicates the organization had 1,946 employees. This 11% increase in employees would result in higher 1999 service cost and offset any benefits derived from the 0.75% increase in the 1999 discount rate.

Requirement 2:

The Fair Value of Plan Assets table indicates that at September 30, 1998 and 1999 the pension plan was overfunded by \$14.6 and \$21.5 million, respectively. Accordingly, the company was not required to make a contribution and didn't.

Requirement 3:

Determine the PBO at September 30, 1999:

Fair value of plan assets at September 30, 1999	\$ 58,517*
Funded status of the plan at September 30, 1999	<u>(21,522)*</u>
PBO at September 30, 1999	<u>\$ 36,995</u>

* Given--Fair Value of Plan Assets Table

The PBO at September 30, 1999 is \$36,995,000.

Requirement 4:

(\$ in thousands)

<u>Funded Status of Plans</u>			<u>Recognized / Unrecognized Amounts</u>	
Projected benefit obligation	\$ (36,995)	CR	Recognized amounts	
Plan assets at fair value	58,517	DR	1. Prepaid benefit cost included in consolidated balance sheet	\$ 10,801 DR
			Unrecognized amounts	
			2. Unrecognized net gain	10,127 DR
			3. Unrecognized prior service costs	(1,025) CR
			4. Unrecognized transition asset	1,619 DR
Excess of plan assets over projected benefit obligation		DR	Excess of plan assets over projected benefit obligation	
	<u>\$ 21,522</u>			<u>\$ 21,522</u> DR

Requirement 5:

Actual dollar return on plan assets for 1999 can be determined by adding the unexpected gain to (or subtracting the unexpected loss from) the expected return on assets per the Components of Net Periodic (Benefit) Cost table.

Actual Return on Plan Assets Year Ended September 30

(\$ in thousands)	1999
Expected return on plan assets	\$ 4,606
Unexpected gain (Given)	<u>3,998</u>
Actual return on plan assets	<u>\$ 8,604</u>

The actual percentage return on plan assets for 1999 can be determined by dividing the actual dollar return on plan assets by fair value of plan assets at September 30, 1998.

$$\frac{\$8,604,000}{\$51,572,000} = 16.7\%$$

Requirement 6:

Since we computed the PBO at September 30, 1999 in Requirement 3, and 1999's actual return on plan assets in Requirement 5, we need only to complete either the PBO or the Fair Value of Plan Asset tables for 1999. In either table, benefits paid to retirees will be the plug number.

Projected Benefit Obligation**Year Ended September 30**

(\$ in thousands)

1999

PBO at beginning of year	\$ 36,954
Service cost	3,700
Interest cost	2,468
Actuarial (gain) loss	(4,468)
Benefit paid (Plug number)	<u>(1,659)</u>
PBO at end of year	<u><u>\$ 36,995</u></u>

Fair Value of Plan Assets**Year Ended September 30**

(\$ in thousands)

1999

Fair value of plan assets at beginning of year	\$ 51,572
Actual return on plan assets	8,604
Benefit paid (Plug number)	<u>(1,659)</u>
Fair value of plan assets at end of year	<u><u>\$ 58,517</u></u>

Requirement 7:

Here we reconcile the unrecognized gain at September 30, 1998 to the balance at September 30, 1999. Most of the information is given and the actual return on plan assets is computed in Requirement 5. The unexpected gain can then be readily determined from the available information.

The actuarial gain of \$4,468 thousand is given in the Projected Benefit Obligation table.

Actuarial Gain**Year Ended September 30**

(\$ in thousands)

Unrecognized net actuarial gain - 1998		\$ 1,647
Actual return on plan assets	\$ 8,604	
Less: Expected return on plan assets	<u>(4,606)</u>	
Unexpected gain		3,998
Recognized actuarial loss		14
Actuarial gain		4,468
Unrecognized net actuarial gain - 1999		<u><u>\$ 10,127</u></u>

C14-4. GE: Interpreting OPEB footnote disclosures**Requirement 1:**

The \$829 million represents reductions in plan coverage subsequent to adopting SFAS 106. A number of firms reduced the benefits originally promised by retiree insurance plans shortly after implementing Statement 106.

One can only speculate about the reasons for the cutbacks:

a) Some suggest that corporate managers were unaware of the total cost of retiree benefit plans until compelled to compute the accrual cost by SFAS 106. Prior to Statement 106, expense was recorded on a "pay-as-you-go" basis, and many companies offering benefits had large numbers of young employees for whom no payments were yet necessary. Consequently, these people argue, firms were blissfully unaware of the true cost of the promised benefits.

This explanation makes many uncomfortable since it implies unsophisticated managerial behavior. On the other hand, the other remaining explanations do not reflect well on management either.

b) Another possibility is that once postretirement employee benefits were recorded in the financial statements, management began to worry about violations of loan and bond covenants. By reducing promised benefits, firms simultaneously reduced the threat of subsequent covenant violation.

This explanation is unconvincing. Many of the early adopters of SFAS 106 also immediately reduced promised benefits. The overwhelming majority of these 1991 and 1992 early adopters adopted SFAS 106 just as G.E. did—using the immediate recognition option. If these companies were suddenly worried about covenant violations, why didn't they adopt using the deferred recognition option?

c) The third explanation for introducing changes after adopting SFAS 106 relates specifically to those firms who used the immediate recognition option. Here, the potential motive is earnings management.

The earnings management scenario is as follows. G.E. adopts SFAS No. 106 effective January 1, 1991. Doing so resulted in a pre-tax adjustment (decrease) in earnings of \$2,710 million since G.E. opted for immediate recognition. This “hit” to earnings caused a decline in bottom line earnings of \$1,667 million compared to 1990 earnings (\$2,636 million of 1991 net income versus \$4,303 million in 1990). While it is not clear how the market reacted to SFAS 106 induced earnings declines, one might hypothesize that it was the existence of an earnings decline—rather than the magnitude of the decline—that was “newsworthy.” Thus, it is plausible that G.E. felt that whatever adverse market reaction might exist would be the same irrespective of whether the earnings decline was \$1,667 or \$3,667.

If this is indeed the way that the market reacts, then an earnings management scenario immediately ensues. Specifically, companies who were contemplating cutting back on postretirement plan benefits would have an incentive **not** to do so until after adopting SFAS 106. By not cutting back prior to 106 adoption, they would take a big “hit” when they did adopt SFAS 106. (But they would not be penalized by the size of the “hit” itself since the market was only presumably monitoring whether earnings were up or down.)

Requirement 2:

Immediately **after** adopting SFAS 106, companies could then cut back on previously promised benefits. Doing so generates an amount that will be amortized into *income* over future years as component 4d. In G.E.'s case, the total amount is \$829 million. If we assume that the expected remaining service life of employees affected by the plan is 10 years (G.E. does not disclose the actual number), then G.E.'s income will be **increased** by \$82.9 million per year over the next ten years through component 4d. Accordingly, the earnings management “plan” is clear. If the market does not penalize firms for the size of the one time “hit,” then firms should strive to **maximize** the

size of the “hit.” Doing so maximizes the amount of the off-balance sheet unamortized amount that ensues once the postretirement cutback (\$829 million in G.E.’s case) is effected. By maximizing this amount, companies have “locked into” an income increase in future years.

C14-5. Groupe Schneider: Effect of postretirement benefits on company valuation

Caveat: The reason suggested in the article for the stock price drop may not necessarily be the “true” reason. The article is used merely to discuss a possible economic consequence of accounting disclosures rather than to illustrate either effective or ineffective handling of an administrative situation.

The article attributes the fall in the stock price to the possibility that Groupe Schneider failed to consider the economic obligation of Square D Co. for its retired employees when valuing the company for acquisition. If the article is correct, then Groupe Schneider might have “overpaid” for Square D. Co.’s stock.

An interesting issue is why might a company forget such an important economic obligation when valuing a potential acquisition candidate? The article states that “France’s system of socialized health care creates a gulf between company operations in that country and in the United States. They are not used to doing what we do....” The point is that under the French system of socialized health care, the government apparently pays for the medical expenses of all French nationals. Consequently, French companies are not likely to offer post-retirement health-care benefits to their employees (obviously, the cost of the socialized health care must be borne by everybody through higher taxes). Thus, one possibility raised in the article is that Groupe Schneider did not consider the postretirement health-care benefits as a potential economic obligation since such a liability does not exist in France.

As discussed in the article, the situation might have been exacerbated by the fact that U.S. companies were using cash basis accounting prior to the adoption of SFAS No. 106. Consequently, the economic obligation for postretirement benefits was not included as part of liabilities of companies. Could this explain why Groupe Schneider might have “overpaid” for the acquisition? Even before the adoption of SFAS No. 106, companies were providing information on the cash outflows for postretirement benefits (similar to Square D’s disclosures). Specifically, Square D had indicated the potential impact of SFAS No. 106 (“...change will result in significantly greater expense being recognized for these benefits...”). Consequently, any potential bidder should have been aware of this off-balance-sheet liability. However, as pointed out by Square D (“While the impact of this new standard has not been fully determined...”), there were uncertainties about the magnitude of the unreported liability.

Regardless of whether any liability is explicitly reported in a balance sheet, a potential acquirer is likely to have access to the internal records of the target company during takeover negotiations. Consequently, Groupe Schneider could have conducted its own actuarial valuation of this important liability.

In summary, the article raises three interesting issues regarding SFAS No. 106. First, it points to the cross-country differences in who is “paying” for health-care costs. Ignoring such differences might lead to real economic consequences such as inappropriate valuation. Second, did the capital market learn more about the value of the postretirement obligation based on the disclosures under the new accounting standard? Third, did the actual recognition of the liability on the balance sheet make any differences as opposed to merely disclosing the cash flows in the footnotes?

Another related issue is the reasons for reassigning Mr. Bommelaer. Is this because of a miscalculation of the Square D purchase price? While we might never know the “true” reasons, the article reinforces how information both on and off the financial statements is relevant for evaluating the financial performance of a company.

A final issue the article discusses is “whether to account for the charge on the books of the French company or of Schneider North America, the U.S. subsidiary that includes Square D.” Since the subsidiary’s financial statements are consolidated with that of the parent company, the decision whether to show the adoption effect of SFAS No. 106 in the books of the parent or the subsidiary is irrelevant for external reporting purposes. However, since the company appears to be examining the two alternative accounting treatments, it must have some internal reporting issues. Maybe incentive compensation of the divisional managers is tied to accounting profits. Consequently, by taking the charge at the parent company level, the North American divisional managers may be insulated from the effects of the new accounting standard.

C14-6. Houston Marine Corporation: Understanding postretirement footnote disclosures

(All numbers are in millions unless otherwise noted.)

Requirement 1:

APBO at December 31, 1998 x discount rate, or
 $\$1,523 \times 7.1\% = \underline{\$108}$

Requirement 2:

Fair value of plan assets at December 31, 1998 x Expected return on plan assets, or $\$62 \times 9.5\% = \underline{\$6}$

Requirement 3:

The contribution for 1999 is the difference between 1999's OPEB expense and the change in the accrued OPEB liability from 1998 to 1999.

1999 OPEB expense	(Given)	\$	153
1999 Accrued OPEB liability		\$	(1,669)
1998 Accrued OPEB liability			<u>(1,595)</u>
Change in OPEB liability			<u>(74)</u>
Employer contribution		\$	<u><u>79</u></u>

The journal entry to record the 1999 OPEB expense and employer contribution would be:

DR OPEB expense		153	
	CR Accrued OPEB liability		74
	CR Cash		79

Requirement 4:

	Fair Value of Plan Assets		
Balance Dec. 31, 1998	62		
Actual return on plan assets	1		
Employer contributions	79	X	Benefit Payments
Balance Dec. 31, 1998	72		

Benefit payment = \$62 + 1 + 79 - 72 or, \$ 70

Note that all of the above information needed to solve the requirement was given except employer contributions, which were determined in Requirement 3.

Requirement 5:

Unrecognized prior service cost Dec. 31, 1998	\$ (45)
Amortization of prior service cost (Given)	5
Unrecognized prior service cost Dec. 31, 1999	<u>\$ (40)</u>

Requirement 6:

Before we can determine the APBO, we need to establish the plan's funded status at December 31, 1999; then we add the fair value of plan assets to the funded status to obtain the APBO at December 31, 1999.

To determine the funded status we need to know the accrued OPEB liability, unrecognized prior service cost, and the unrecognized gain. Unrecognized prior service costs were determined in Requirement 5, the balance of the information is given in the problem.

Accrued OPEB liability	\$ 1,669
Unrecognized prior service cost	(40)
Unrecognized gain	<u>(395)</u>
Funded status	1,234
Fair value of plan assets	<u>(72)</u>
APBO at December 31, 1999	<u>\$ 1,306</u>

Requirement 7:

Unrecognized gain at Dec. 31, 1998	\$ 89
Expected return on plan assets (Requirement 2)	\$ (6)
Actual return on plan assets	<u>1</u>
Unexpected loss	(5)
Actuarial gain (Plug number)	311
Unrecognized gain at Dec. 31, 1999	<u>\$ 395</u>

Requirement 8:

Determine 1999's amortization of the net gain, assuming an average remaining service life of 10 years:

All as of December 31, 1998				
APBO	Fair Value Plan assets	Corridor	Unrecognized Gain	1999 Amortization
\$ 1,523	\$ 62	\$ 152	\$ 89	\$ 0

No amortization of unrecognized gain is necessary in 1999 since the unrecognized gain was within the 10% corridor.

Requirement 9:

At this point all the information required to complete the **Accumulated Postretirement Benefit Obligation** table in the footnote is known except for the service cost. By completing the APBO table we can back into the service cost.

Accumulated Postretirement Benefit Obligation

(\$ in millions)

1999

APBO at beginning of year	\$ 1,523
Service cost (Plug number)	56
Interest cost	108
Actuarial loss (gain)	(311)
Benefit payments	(70)
APBO at end of year	<u>\$ 1,306</u>

Requirement 10:**Funded Status of Plan at December 31, 1999:**

(\$ in millions)

Funded Status of Plan		Recognized / Unrecognized Amounts	
Accumulated postretirement benefit obligation	\$ 1,306 CR	Recognized amounts	
Plan assets	(72) DR	1. Accrued postretirement benefit obligation	\$ 1,669 CR
		Unrecognized amounts	
		2. Unrecognized net gain	(395) DR
		3. Unrecognized prior service costs	(40) DR
Accumulated postretirement benefit obligation in excess of plan assets	<u>\$ 1,234 CR</u>	Accumulated postretirement benefit obligation in excess of plan assets	<u>\$ 1,234 CR</u>

Requirement 11:

Postretirement Benefits

Other postretirement benefits, including certain health care and life insurance benefits, are provided to retired employees. The amount of health care benefits is limited to lifetime maximums as outlined in the plan. Substantially all employees of Houston Marine may become eligible for these benefits if they satisfy eligibility requirements during their working lives.

The following table provides a reconciliation of the changes in the plan's benefit obligations and fair value of assets for the years ended December 31, 1999 and 1998:

Accumulated Postretirement Benefit Obligation (\$ in millions)	1999	1998
APBO at beginning of year	\$ 1,523	\$ 1,353
Service cost	56	52
Interest cost	108	99
Actuarial loss (gain)	(311)	84
Benefit payments	(70)	(65)
APBO at end of year	<u>\$ 1,306</u>	<u>\$ 1,523</u>

Fair Value of Plan Assets (\$ in millions)	1999	1998
Fair value of plan assets at beginning of year	\$ 62	\$ 49
Actual return on plan assets	1	4
Employer contributions	79	74
Benefit payments	(70)	(65)
Fair value of plan assets at end of year	<u>\$ 72</u>	<u>\$ 62</u>

The following table provides a statement of funded status of the plan as of December 31, 1999 and 1998, with the amounts recognized in the accompanying balance sheet:

Funded Status (\$ in millions)	1999	1998
Accumulated postretirement benefit obligation	\$ 1,306	\$ 1,523
Fair value of assets	72	62
Funded status at December 31:	(1,234)	(1,461)
Unrecognized gain	(395)	(89)
Unrecognized prior service cost	(40)	(45)
Accrued OPEB liability	<u>\$ (1,669)</u>	<u>\$ (1,595)</u>
Amounts recognized in the Balance Sheet:		
Accrued benefit liability	<u>\$ (1,669)</u>	<u>\$ (1,595)</u>

The following tables provide the components of net periodic OPEB cost for the years ended December 31, 1999, 1998 and 1997:

Net Periodic OPEB Cost (\$ in millions)	1999	1998	1997
Service costs	\$ 56	\$ 52	\$ 44
Interest costs	108	99	92
Expected return on assets	(6)	(5)	(4)
Amortization of prior service cost	(5)	(5)	(5)
Amortization of unrecognized net gain	0	(2)	(9)
Net periodic OPEB cost	<u>\$ 153</u>	<u>\$ 139</u>	<u>\$ 118</u>

The following assumptions were used by the Company in the measurement of the benefit obligation as of December 31:

Weighted-Average Assumptions	1999	1998
Discount rate	7.10%	XX%
Expected return on plan assets	9.50%	XX%

C14-7. Chrysler Corporation (KR): OPEB expense and management incentive compensation

This problem illustrates the potential effects of mandatory changes in accounting methods on existing firm contracts. Prior to SFAS No. 106, companies typically used a cash basis method to report expenses for post-retirement medical payments to employees. However, SFAS No. 106 required companies to switch to an accrual basis method for reporting purposes. This impacted the income statement of companies in two ways. First, a move from a cash to the accrual basis increased the magnitude of the expense in most companies. Second, at the time of the switch from a cash to accrual basis, companies were left with a significant unrecorded liability. As per SFAS No. 106, this unrecorded liability can be brought into the books by taking a one-time hit to the income statement or by gradually amortizing it as a part of operating expenses over the following several years. Together, these two items decrease the current and future accounting income of most companies.

Since accounting earnings are used in various corporate contracts (e.g., bond contracts, credit agreements, compensation contracts, etc.), a change in the accounting measurement rules might negatively impact one or more of the parties to a pre-existing contract. In this problem, we focus on the potential impact of the SFAS No. 106 on the incentive compensation contract in Chrysler Corporation. Since the promulgation and the effects of this accounting standard were not fully anticipated, both Chrysler and its employees appear to have not considered the potential effects of this accounting standard when defining the accounting income to base the incentive awards.

When the FASB required companies to change the accounting method, this would have had a significant impact on the incentive compensation potentially payable under the existing contract. The proxy statement suggests that by switching to an accrual basis accounting for postretirement benefits, the net income of the company would decrease by \$240 million. If the existing contracts are left in place, then SFAS No. 106 will significantly reduce or even eliminate incentive compensation payable to its officers and senior executives.

The issue is why should Chrysler worry about paying “less” compensation to its employees. Wouldn’t the company be better off? As pointed out by the company, its ability to hire and retain competent executives is dependent on paying them their “market” wages. Thus, while Chrysler may be better off in the short run if the existing incentive contract is unaltered, it might lead to significant personnel turnover at the executive ranks with the resultant adverse consequences.

A final issue deals with the question whether Chrysler is paying “too much” to its executives by failing to incorporate the “true” OPEB expense to calculate the incentive compensation. This is unlikely to be the case. One possibility is that if GAAP had all along required an accrual accounting approach for OPEB, then Chrysler might have put a limit of, say, 10% on the amount that is transferred to the bonus pool rather than the currently specified 8%. In essence, the adjustment recommended by the management is to ensure that the existing system of incentive compensation does not become suboptimal.