



SoftwarePolish

Rick Groszkiewicz  
2974 Nestle Creek Drive  
Marietta, GA 30062-4857

Voice/fax (770) 971-8913  
email: [rickg@softwarepolish.com](mailto:rickg@softwarepolish.com)  
<http://www.softwarepolish.com>

# 2004 EA-2B EXAM SOLUTIONS

Copyright © 2005 by  
Rick Groszkiewicz FSA EA

## 2004 EA-2B Exam Solutions

---

These solutions were prepared based on the law as in effect at December 31, 2003.

These solutions have been compared with those produced by other technical actuaries, and they represent my best understanding of the correct way to solve these problems. As usual, it seems easy to get an answer in the correct range as long as you are not actually taking the exam!

This exam had far fewer calculation type problems than prior years. There were more 2 and 3 point problems that tested general pension knowledge than in earlier years.

### Revision History:

April 29, 2019	Corrected solution for problem 38
January 26, 2016	Clarified solution for problem 39
April 5, 2010	Clarified solution for problem 43
April 25, 2007	Clarified solutions for problems 30 and 36
March 8, 2007	Corrected solution for problem 18
December 10, 2006	Clarified solution for problem 25
April 21, 2006	Corrected solution for problem 18
March 24, 2006	Corrected solution for problem 33, clarified solution for problem 30
December 29, 2005	Corrected solution for problem 41
December 22, 2005	Corrected solution for problem 15, added note to Problem 18 solution
May 9, 2005	Corrected solution for problems 16 and 21
May 3, 2005	Corrected solution for problem 27
May 2, 2005	Corrected solution for problems 15 and 37
April 11, 2005	Corrected solution for problem 24
February 15, 2005	Original solutions

## 2004 EA-2B Exam Solutions

---

### Problem 1

FALSE

Under the 1.411(d)-4 regulation, it lists the following as protected benefits:

- Accrued benefits
- Optional forms of benefit
- Early retirement benefits and retirement type subsidies

At Q&A-1(a) it states that

"Such benefits, to the extent they have accrued, are subject to protection of section 411(d)(6) ..."

The plan can not eliminate the unreduced early retirement option for any accrued benefits under the plan as of the date of the plan change. It is not sufficient to protect the accrued benefits for participants who have 30 years of service.

**Answer is B**

### Problem 2

TRUE

As shown in Item 14(a) of the PBGC-1 form, there is no variable rate premium for a multiemployer plan.

**Answer is A**

## 2004 EA-2B Exam Solutions

---

### Problem 3

TRUE

Section 4044(d)(1) of ERISA states that a plan may distribute excess assets to the employer if the plan has such a provision. Section 4044(d)(2)(A) of ERISA states that any such amendment will not be treated as effective until the end of the 5<sup>th</sup> calendar year following the date of adoption.

**Answer is A**

### Problem 4

FALSE

This item has been tested numerous times on past exams. In 901.20(d), it states that a conflict of interest does not prevent an actuary from performing services. Once they have made full disclosure of the conflict of interest, they can continue to provide actuarial services. The disclosure should be made to the plan trustees, any named fiduciary of the plan, and the plan administrator (and the collective bargaining representative, if applicable).

**Answer is B**

## 2004 EA-2B Exam Solutions

---

### Problem 5

FALSE

The threshold for a de minimis spinoff is 3% of plan assets.

**Answer is B**

### Problem 6

FALSE

According to ERISA, a fiduciary is any person so named in the plan document or any person who exercises any discretionary authority or control with respect to the management or administration of the plan or its assets. See IRC Section 4975(e)(3).

In this example, Smith is not a fiduciary. However, the plan administrator is a fiduciary, since they will act on Smith's recommendation, and decide who will be the investment manager.

**Answer is B**

## 2004 EA-2B Exam Solutions

---

### Problem 7

TRUE

You are exempt from the PBGC notice requirement if you would be exempt from the 412(l) additional funding charge solely based on the funded current liability percentage (FCL%), regardless of the number of participants. You are exempt if (i) the FCL% is 90% or more, or (ii) it is 80% or more this year, and the FCL% is greater than or equal to 90% for two consecutive years of the prior three.

Based on this definition, the plan was exempt from the 412(l) additional funding charge for 2003, but not for 2004.

The PBGC-1 Form allows you to satisfy the " Deficit Reduction Contribution exemption test" based on either the current or the prior plan year. This is from the 2004 Form PBGC-1 instructions:

"EXEMPTIONS: A plan that meets the Deficit Reduction Contribution (DRC) Exception Test for the 2003 plan year or for the 2004 plan year is exempt from having to provide a Participant Notice for the 2004 plan year."

**Answer is A**

### Problem 8

Similar to 1999 #19
---------------------

FALSE

The rule regarding time for adoption of a corrective amendment at 1.401(a)(4)-11(g)(3)(iv) states the amendment "must be adopted and implemented on or before the 15<sup>th</sup> day of the 10<sup>th</sup> month after the close of the plan year ...".

**Answer is B**

## 2004 EA-2B Exam Solutions

---

### Problem 9

TRUE

In IRC Section 412(h)(2), it states that Section 412 does not apply to an insurance contract plan described in Section 412(i). The fact that the plan is not Top Heavy means that it meets the description in 412(i)(3), which states "benefits provided by the plan are equal to the benefits provided under each contract at normal retirement age ...

**Answer is A**

### Problem 10

FALSE

In IRC Section 411(a)(8), it defines normal retirement age as follows:

The earlier of

(A) When the participant attains normal retirement age under the plan, or

(B) The later of

a. Age 65, or

b. The 5<sup>th</sup> anniversary of participation in the plan

This employee became a participant at the effective date of 01/01/1999. They attain age 65 on 01/01/2003. The 5<sup>th</sup> anniversary of participation is 01/01/2004.

This participant's latest possible normal retirement age would be in 2004, at age 66.

**Answer is B**

## 2004 EA-2B Exam Solutions

---

### Problem 11

FALSE

In ERISA Section 405(a)(3), it states that a fiduciary will be liable for a breach of fiduciary responsibility if they have knowledge of such breach. However, a fiduciary will not be liable if they make reasonable efforts to remedy the breach.

**Answer is B**

### Problem 12

TRUE

This situation is covered in the 1.411(d)-4 regulation at Q&A-2(a)(2)(iv):

"(iii) Buy-back rule.

Notwithstanding paragraph (a)(2)(ii) of this Q&A-2, an employee who received a distribution of his nonforfeitable benefit from a plan that is required to provide a repayment opportunity to such employee if he returns to service within the applicable period pursuant to the requirements of section 411(a)(7) and who, upon subsequent reemployment, repays the full amount of such distribution in accordance with section 411(a)(7)(C) must be reinstated in the full array of section 411(d)(6) protected benefits that existed with respect to such benefit prior to distribution."

**Answer is A**



## 2004 EA-2B Exam Solutions

---

### Problem 13

FALSE

Logically, it makes no sense that a tax-exempt foundation would owe any excise tax. The reason is that they did not deduct the contribution for tax purposes.

IRC Section 4972 has rules to determine the excise tax for non-deductible contributions. In 4972(d)(1)(B), there is an exemption for governmental and tax exempt plans under 4980(c)(1).

**Answer is B**

### Problem 14

TRUE

In the regulation at 901.20(h), it requires the actuary to report any non-filing of actuarial documents they have signed. Since the actuary did not sign the PBGC-1 forms, they do not need to notify the PBGC of the non-filing.

**Answer is A**

FALSE

The description of the accrued benefit satisfies the fractional rule under 411(b)(1)(C). But it does not meet the definition for nondiscrimination testing safe harbor fractional rule plans.

The definition of the fractional rule safe harbor at 1.401(a)(4)-3(b)(4)(i) has two additional requirements. One states that the employee's accrued benefit for any plan year before NRA must equal the product of the employee's fractional rule benefit (under 1.411(b)-1(b)(3)(ii)(A)) and the ratio: ("years of service" / total projected "years of service").

At 1.401(a)(4)-12, year of service is defined as follows, which seems to imply it would be benefit accrual service for the safe harbor definition:

"Year of service means a year of service as defined in the plan for a specific purpose, including the method of crediting service for that purpose under the plan."

As a result, this calculation seems to be the same as the fractional rule calculation.

In addition, the plan must meet one of three requirements at 1.401(a)(4)-3(b)(4)(i)(C):

1. It must be impossible for any employee to accrue a benefit for a year of service that is more than  $33 \frac{1}{3}\%$  greater than that accrued in any year by any other employee. This is based on actual and potential employees, but none with more than 33 years at NRA.
2. The benefit at NRA must be defined under the plan as a flat benefit. The participant's accrued benefit must be reduced on a pro-rata basis with less than 25 years of service.
3. Average Normal accrual rate (NAR) for non-excludable non-HCEs is  $\geq 70\%$  \* (Average NAR for non-excludable HCEs). This test is based on all non-excludable employees, even if NOT benefiting under the plan. All other plans are excluded for this test.

The definition of the plan benefit does not seem to satisfy any of these additional requirements, so it does not meet the definition of the fractional rule safe harbor at 1.401(a)(4)-3(b)(4)(i).

**Answer is B**

**NOTE:**

If you aren't sure the plan fails criteria #1, see the detailed calculations on the next page.

### Problem 15 – Page 2

Added 12/22/05

Criteria #1 on the prior page is not the same as the 133 1/3% rule. It is based on actual yearly benefit accruals. Consider two participants, one who is hired at 55, and the other who is hired at 35.

The projected benefit for the first employee is 3%(10). Their benefit accrual in the last year (age 64) equals  $(\text{Accrued Benefit})_{10} - (\text{Accrued Benefit})_9$ :

$$\begin{aligned} &= 30\%[10/10] - 30\%[9/10] \quad (\text{using the fractional rule}) \\ &= 3\% \end{aligned}$$

The projected benefit for the second employee is 3%(10) + 2%(10) + 1%(10). Their benefit accrual in the last year (age 64) equals  $(\text{Accrued Benefit})_{30} - (\text{Accrued Benefit})_{29}$ :

$$\begin{aligned} &= 60\%[30/30] - 60\%[29/30] \quad (\text{using the fractional rule}) \\ &= 2\% \end{aligned}$$

This fails the test, since the ratio for these two employees is 150%. This is not actually the worst case. The test in the regulation allows for employees with up to 33 years of service, which produces a slightly lower benefit accrual than 2% per year.

THIS PAGE WAS INTENTIONALLY LEFT BLANK

## 2004 EA-2B Exam Solutions

---

### Problem 16

Revised 05/09/05

The key point of this problem is the definition of a rate group. A rate group consists of all employees with both a normal accrual rate (NAR) and a most valuable accrual rate (MVAR) that are equal to or exceed those rates for a given HCE.

For normal accrual rates, you can group all rates within 105% of the midpoint. For most valuable accrual rates, you can group all rates within 115% of the midpoint.

Using the NAR as the midpoint, the rate band includes NAR values between  $(2.0\%)*.95$  and  $(2.0\%)*1.05$ , or from 1.90% to 2.10%. Using the MVAR as the midpoint, the rate band includes MVAR values between  $(3.0\%)*.85$  and  $(3.0\%)*1.15$ , or from 2.55% to 3.45%.

Of the four employees, only Green has both a normal accrual rate (2.08%) and a most valuable accrual rate (2.65%) that falls within the rate band.

**Answer is D**

#### NOTE:

The question does NOT ask which employees are in the rate group. The rate group is based on all employees with rates greater than or equal to both the NAR and the MVAR for the HCE. The rate group includes everyone with an NAR of 1.90% and up, and also with an MVAR of 2.55% and up - only Brown is not in the rate group.

## 2004 EA-2B Exam Solutions

---

### Problem 17

The key point of this problem is if you know how EGTRRA changed the 401(a)(17) compensation limit. In EGTRRA, the 401(a)(17) limit was increased to 200,000.

But it was not a mandatory increase. In Notice 2001-56 Section B (Effective Date), it says: "... the plan is permitted to provide that the \$200,000 compensation limit applies to annual compensation for such prior periods in determining such accruals or allocations."

The problem asks for the highest Average Annual Compensation that could be used. This implies that you should assume the use of 200,000 for prior years:

Year	401(a)(17)		Retroactive	
	Limit	Earnings	Apply 401(a)(17)	200,000 401(a)(17)
1999	160,000	170,000	160,000	170,000
2000	170,000	175,000	170,000	175,000
2001	170,000	180,000	170,000	180,000
2002	200,000	190,000	190,000	190,000
2003	200,000	210,000	200,000	200,000
Total		925,000	890,000	915,000
AAC		185,000	178,000	183,000

As shown above, the resulting value is 183,000.

**Answer is C**

#### NOTE:

When the 401(a)(17) limit was reduced by OBRA in 1993, the IRS made it clear that it applied retroactively. The reason was that it reduced benefits for everyone.

In EGTRRA, the 401(a)(17) limit was increased to 200,000. Since this could increase benefits for everyone, the IRS did NOT force it to be applied retroactively.

## 2004 EA-2B Exam Solutions

### Problem 18

Revised 03/08/07

Since you have an individual cost method, you do not need to allocate the 412 bases using the rules in Revenue Ruling 81-212. You can directly calculate the amount of the outstanding 412 bases for each plan, based on the usual relationship:

$$\text{UAL} = \text{O/S 412 bases} - \text{CB} - \text{ARA}$$

$$= \text{AL} - \text{AAV}$$

$$\text{O/S 412 bases} = \text{UAL} + \text{CB} + \text{ARA}$$

	Plan B	Plan C	Plan A
Accrued Liability	1,000,000	775,000	1,775,000
Actuarial assets	774,127	715,000	1,489,127
UAL	225,873	60,000	285,873

	Plan B	Plan C	Plan A
UAL	225,873	60,000	285,873
Credit balance	15,000	77,000	92,000
O/S 412 bases	240,873	137,000	377,873

Plan B's share of each base is  $63.74\% = (240,873 / 377,873)$ . You are given the amortization amounts for three different bases. You can simply combine all the bases, and allocate the net amortization to Plan B:

$$38,247 = 63.74\%(20,000 + 60,000 - 20,000)$$

### 2004 Minimum Funding Standard Account

Charges		Credits	
Normal Cost	100,000	Credit Balance	15,000
Net amortization	38,247		
		12/31/04 contribution	x
7.5% interest	10,369	7.5% interest	1,125
Total charges	148,616	Total credits	x+16,125

The minimum contribution for Plan B is  $132,491 = 148,616 - 16,125$ . You should think about the ERISA Full Funding Limitation. The ERISA FFL equals  $1.075 \times (100,000 + 1,000,000 - [774,127 - 15,000])$ . The resulting FFL of 366,438 does not result in a FFL credit.

**Answer is C**

### NOTES:

1. If you attempt to allocate the IAL base entirely to Plan B, you will get the wrong answer.
2. If you try to calculate the O/S 412 amortization bases at 7.5% using the remaining period based on the original dates given, they do NOT match the values calculated above. This appears to be a minor error in the problem's data.

## 2004 EA-2B Exam Solutions

---

### Problem 19

Similar to 2003 #33

Since this is the 2004 PBGC premium calculation under the General Rule, the determination date is 01/01/2004. You must calculate the adjusted asset value.

Use the asset value at 01/01/04, and reduce it by any included receivable contributions. Then you must add the discounted value of “contributions paid for plan years prior to the premium payment year ...” In this problem, you are not told which plan year the receivable contribution is for.

Under the General Rule, the interest rate used for discounting assets is always the valuation rate:

$$\begin{aligned} 01/01/04 \text{ Adjusted assets} &= (1,800,000 - 400,000) + 400,000 * (1.08)^{(-.5)} \\ &= 1,784,900 \end{aligned}$$

**Answer is D**

You get the same answer range using simple interest:

$$\begin{aligned} 01/01/04 \text{ Adjusted assets} &= (1,800,000 - 400,000) + 400,000 / (1.04) \\ &= 1,784,615 \end{aligned}$$



## 2004 EA-2B Exam Solutions

---

### Problem 20

Similar to 1985 #12
---------------------

The key to this problem is if you know the definition of the annual withdrawal liability payment. This has not been tested on the EA2 exam since 1985.

The annual payment amount is the product of (1) and (2):

- (1) Highest contribution rate in the 10 years including year of withdrawal
- (2) Highest consecutive 3 year average of hours in the 10 years excluding year of withdrawal

In this problem, the withdrawal year is 2004. The highest contribution rate in the 10 years from 1995 through 2004 is .27.

The highest consecutive 3 year average of hours in the 10 years from 1994 through 2003 is 126,667. This is calculated using the years 1998 through 2000:

$$126,667 = (1/3)[130,000 + 110,000 + 140,000]$$

The annual payment amount is  $34,200 = .27(126,667)$ .

**Answer is E**

### NOTE:

There are other definitions that may be tested in future years. There is a 20 year payment cap. The payments stop after 20 years, even if the withdrawal liability exceeds the present value of 20 years of annual payments.

The actual payments are made quarterly. The quarterly payment amount is  $\frac{1}{4}$  of the annual payment amount. The first quarterly payment is made at the start of the plan year following the year of withdrawal.

## 2004 EA-2B Exam Solutions

---

### Problem 21

Revised 05/09/05

This is the first question asked on the EA-2B exam on the actual calculation of the excise tax for failure to provide a 204(h) notice. There is a 204(h) notice required for employees of Subsidiary Z. The participants should have received the notice before the plan benefits were frozen at June 30, 2004.

IRC Section 4980F(b)(1) defines the excise tax for failure to file a 204(h) notice. It is equal to \$100 per participant per day in the noncompliance period. The details of the excise tax calculation are contained in the 54.4980F regulation. Q&A-6 defines when the 204(h) notice should be provided.

The general rule is that the 204(h) notice must be provided at least 45 days before the effective date of any 204(h) amendment. There is a special 15 day rule for "business transactions", which includes acquisitions or dispositions.

The 204(h) notice was actually provided 30 days after the sale of Z. The period of noncompliance was 45 days (15+30).

The excise tax for failure to provide the notice is calculated as follows:

$$247,500 = \$100(55 \text{ ees})(45 \text{ days})$$

**Answer is B**

## 2004 EA-2B Exam Solutions

---

### Problem 22 - Page 1

This is a fairly typical problem on 415. This tests your ability to calculate the 415 limits under EGTRRA. The first step is calculation of the plan benefit without the 415 limits.

#### As of 12/31/2004:

Age	55	Birth date	12/31/49
Service	10 years	Hire date	01/01/95
Participation	10 years	Entry date	01/01/95

This final average earnings includes pay for the final three plan years (2001 to 2003):

Final average earnings at 12/31/04 =  $104,000 = (104,000 + 104,000 + 104,000) / 3$   
Each year's pay is limited by 401(a)(17)

Accrued benefit at age 55 =  $104,000 * 10.0\% * 10$   
= 104,000

Normal retirement benefit at 55 =  $104,000 = 104,000 * 1.0000$

Plan lump sum at 5.00% IAM-F =  $1,592,240 = 104,000 * 15.3100$   
417 lump sum at 4.93% "applicable" =  $1,526,720 = 104,000 * 14.6800$

Greater of two lump sum values = 1,592,240

#### 415 compensation limit

The second step is calculation of the §415 compensation limit. Earnings used for the §415 compensation limit are not subject to the §401(a)(17) limit. The §415(b)(1)(B) compensation limit is reduced when service is less than ten years.

100% 3 year comp. §415 limit =  $104,000 = (104,000 + 104,000 + 104,000) / 3$

Reduced §415 compensation limit =  $104,000 = 104,000 * (10/10)$

#### 415 dollar limit

The third step is calculation of the §415 dollar limit under §415(b)(1)(A). The dollar limit is reduced when participation is less than ten years. Under EGTRRA, the dollar limit is available unreduced between ages 62 and 65:

§415 dollar limit at age 62 =  $165,000 * (10/10)$   
= 165,000

## 2004 EA-2B Exam Solutions

---

### Problem 22 - Page 2

§415(b)(2)(E)(i) says to use the greater of 5% and the interest rate specified in the plan to reduce the §415 dollar limit prior to age 62, but here the code is misleading. The examples in Revenue Ruling 98-1 clarify that the §415 dollar limit is reduced using the lower of the factors calculated based on the mandated mortality and interest rate, and the plan basis for actuarial equivalence.

In this problem, you are given the factors for  $\ddot{a}_{55}^{(12)}$  and  $\ddot{a}_{62}^{(12)}$  on several bases. Since your death benefit equals 100% of the present value of the accrued benefit, you should use the  $v^7 (\ddot{a}_{62}^{(12)} / \ddot{a}_{55}^{(12)})$  factors to reduce the dollar limit prior to age 62. With this death benefit, there is no risk of forfeiting the benefit, and there is no mortality risk involved.

$$\text{Actuarial reduction from 62 to 55} = v^7 (\ddot{a}_{62}^{(12)} / \ddot{a}_{55}^{(12)})$$

$$\text{Plan basis 5.00\% IAM-F} = .6332 = .7107 * (13.6400 / 15.3100)$$

$$\text{Mandated basis 5.0\% "applicable"} = .6185 = .7107 * (12.6800 / 14.5700)$$

$$\begin{aligned} \text{\$415 dollar limit at age 55} &= 165,000 * \text{lesser of } [.6332 \text{ or } .6185] \\ &= 102,051 \end{aligned}$$

$$\text{Final \$415 limit at age 55} = 102,051 = \text{lesser of } 102,051 \text{ and } 104,000$$

### **415 Limit on lump sum basis**

The final step is to determine the actuarial equivalent of the final 415 limit on a lump sum basis, and to compare this to the plan lump sum.

The examples in Revenue Ruling 98-1 clarify that the §415 limit is adjusted using the lower of the factors calculated using the mandated mortality and interest rate, and the plan basis for actuarial equivalence. In general, the adjustment of the 415 limit for form of payment on the mandated basis uses the 5% interest rate. When the form of payment is subject to 417(e)(3), such as a certain only annuity, or a lump sum, the mandated basis uses the applicable interest rate instead of the 5% interest.

$$\text{Plan basis: 5.00\% IAM-F} = 15.3100$$

$$\text{Mandated basis: 4.93\% "applicable"} = 14.6800$$

$$\text{415 lump sum} = 102,051 * \text{lesser of } [15.3100 \text{ or } 14.6800]$$

$$\text{Lesser of 415 and plan lump sums} = 1,498,113$$

**Answer is B**

## 2004 EA-2B Exam Solutions

---

### Problem 23

The key to this problem is if you know the definition of a fiduciary, and of the fiduciary standards. The fiduciary standards are outlined in Part 4 of ERISA, Act Sections 401 through 414.

According to ERISA, a fiduciary is any person so named in the plan document or any person who exercises any discretionary authority or control with respect to the management or administration of the plan or its assets. See IRC Section 4975(e)(3).

#### I. TRUE

This is clearly true. There is nothing in the definition that prevents a beneficiary from also being a fiduciary.

Consider a plan for a sole proprietor. They may be the plan administrator, and also receiving benefits.

#### II. TRUE

The attorney who drafts the plan document does NOT satisfy the definition of a fiduciary.

#### III. TRUE

This is required in ERISA Section 402(a).

#### IV. TRUE

This is allowed in ERISA Section 402(c)(1).

All of the items are True.

**Answer is E**

### Problem 24

Revised 04/11/05

#### I. TRUE

In the regulation at 901.20(b), it reads as follows:

"(b) Professional duty. An enrolled actuary shall not perform actuarial services for any person or organization which he/she believes or has reasonable grounds for believing may utilize his/ her services in a fraudulent manner or in a manner inconsistent with law."

#### II. TRUE

In the regulation at 901.20(h), it requires the actuary to report any non-filing of actuarial documents they have signed. Since the actuary did sign the PBGC-1 forms, they need to notify the PBGC of the non-filing.

#### III. FALSE

Since the PBGC-1 form is not filed with the Department of Labor (DOL), the actuary does not need to notify the DOL.

Only I and II are True.

**Answer is A**

## 2004 EA-2B Exam Solutions

---

### Problem 25

Revised 12/10/06

The problem asks for the 100% of Compensation limit under IRC Section 415(b)(1)(B). The key point is this 415 limit uses total pay (it is NOT subject to the 401(a)(17) compensation limit). It is also based on the highest consecutive three years, going back to hire date:

$$195,000 = 1/3 (195,000 + 215,000 + 175,000)$$

**Answer is D**

#### NOTES:

1. The problem states that the plan permits use of the greatest compensation for benefit purposes. This implies that the plan accrued benefit is calculated using 200,000 for the 401(a)(17) compensation limit for prior years. See problem 17 for more discussion.
2. The participant has more than 10 years of service (from hire), but less than 10 years of participation service. The 100% of Compensation limit under IRC Section 415(b)(1)(B) is reduced based on less than 10 years of service, so it is not reduced for this participant.

## 2004 EA-2B Exam Solutions

---

### Problem 26

This problem is a straightforward calculation problem. The first step is calculation of the defined benefit plan accrued benefit. Next is the Top Heavy (T-H) minimum. You should offset the T-H minimum by the level annual equivalent benefit from the profit sharing plan. The final step is to take the greater of the DB accrued benefit and the T-H minimum.

In this problem, the benefit formula uses participation service. You can't get the wrong answer, since the participant is hired at the plan effective date:

12/31/2004 Age	56
Past service	1
Normal retirement age	65

Plan accrued benefit  $750.00 = 1.5\%(1)(50,000)$

The minimum accrual in a T-H plan is 2% of compensation for each year the plan is Top Heavy. The T-H minimum accrued benefit is  $2\%(T-H \text{ service})(T-H \text{ pay})$  on a life annuity basis. You are told that the plan was only Top Heavy for one year (2004):

T-H minimum  $1,000.00 = 2\%(1)(50,000)$

The level annual equivalent benefit from the profit sharing plan is calculated in the same manner as when you cross-test a DC plan under 401(a)(4). You accumulate the account balance with interest to NRA, then divide by the life annuity factor:

PS Account at NRA	$1,838.46 = 1,000(1.07)^{(65-56)}$
Level annual benefit	$189.53 = 1,838.46 / 9.70$

Final T-H minimum  $810.47 = 1,000.00 - 189.53$

Final accrued benefit  $810.47$  (greater of plan accrued and T-H min)

**Answer is C**

### NOTE:

If employees participate in both a top-heavy DB plan and a top-heavy DC plan, minimum benefits do not have to be provided in both. There are four safe harbor alternatives discussed in the M-12 of the 1.416 regulation.

- Provide T-H minimum only in DB plan
- Provide T-H minimum in DB plan, but offset the DB minimum by equivalent level benefit under the DC plan (cheaper than 1)
- Prove through analysis of comparability of benefits (see RR 81-202) that the plans provide benefits  $>$  DB minimums
- Provide contributions + forfeitures  $\geq 5\%$  of compensation under DC plan



## 2004 EA-2B Exam Solutions

### Problem 27 - Page 1

Similar to 2002 #33

This problem tests your knowledge of the method for adjusting assets and discounting contributions under the Alternative calculation method (ACM) for calculating the Variable Rate Premium (VRP) on the PBGC-1 Form, Schedule A. In addition, you need to calculate the fixed rate premium, and allow for the estimated premium payments already made for 2004.

Since this is the 2004 PBGC premium calculation under the ACM, the determination date is 01/01/2003. You must calculate the adjusted liability values. Here is the formula:

$$VB_{adj} = VB_{pay} * 0.94^{(RIR-BIR)} + [VB_{Nonpay} * 0.94^{(RIR-BIR)} * ((100+BIR)/(100+RIR))^{(ARA-50)}]$$

In the formula, RIR equals 4.93 and BIR equals 6.09 (100 times the required interest rate and the current liability interest rate, respectively). One key point of the problem is that, for participants who are not in pay status, the formula given does not include the 1.07 adjustment in the PBGC-1 instructions.

	In pay status	Not in pay status
Group	Retired	Active and terminated vested
Unadjusted vested liability	933,000	1,821,000
Adjustment factor	$.94^{(4.93-6.09)}$ = 1.0744	$1.07 * (.94^{(4.93-6.09)}) * [(106.09/104.93)^{15}]$ = 1.3557
Adjusted vested liability	1,002,428	2,468,807

The total adjusted vested current liability at 01/01/2003 is 3,471,235.

Use the actuarial asset value at 01/01/03, and reduce it by any included receivable contributions. Then you must add the discounted value of “contributions paid for plan years prior to the premium payment year ...” The interest rate used for discounting assets is always the Required Interest Rate:

$$\begin{aligned} 01/03 \text{ Adjusted assets} &= (2,518,000 - 300,000) + 100,000 * (1.0493)^{(-.5/12)} \\ &\quad + 200,000 * (1.0493)^{(-8.5/12)} \\ &= 2,511,097 \end{aligned}$$

$$\begin{aligned} 01/03 \text{ Unfunded vested liability} &= 3,471,235 - 2,511,097 \\ &= 960,138 \end{aligned}$$

## 2004 EA-2B Exam Solutions

---

### Problem 27 - Page 2

Revised 05/03/05

The adjusted value of the unfunded benefits liability is the excess of the liabilities over the adjusted assets, "adjusted for the passage of time from the first day of the plan year preceding the premium payment year to the premium snapshot date." The interest rate used for the adjustment is the Required Interest Rate:

$$\begin{aligned} \text{01/04 Unfunded vested liability} &= 960,138 * 1.0493 \\ &= 1,007,473 \end{aligned}$$

The adjusted unfunded benefits liability must be rounded up to the next multiple of 1,000. The last step is to multiply the adjusted value of the unfunded benefits liability by .009:

$$\begin{aligned} \text{2004 Variable rate premium} &= 1,008,000 * .009 \\ &= 9,072 \end{aligned}$$

The fixed rate premium is 11,343 = 19(597 participants). The total PBGC premium is the sum of 9,072 and 11,343, or 20,415. The remaining amount that must be paid at 10/15/2004 is the excess of the total premium over the estimated premium already paid:

$$\text{O/S PBGC premium} = 3,372 = 20,415 - 17,043$$

**Answer is D**

### NOTES:

1. The Alternative Calculation Method (ACM) normally uses current liability values from the prior year's Schedule B. The adjusted liability values allow for the difference between the current liability interest rate and the required interest rate.
2. You may value current liabilities at the required interest rate under the ACM, but only if the required interest rate exceeds the current liability interest rate. Then the only adjustment made to the current liabilities is the 1.07 factor for those not yet in pay status.

## 2004 EA-2B Exam Solutions

---

### Problem 28 - Page 1

Similar to 2001 #22
---------------------

This is a typical PBGC guaranteed benefits question. It tests your knowledge of the 30 year phase-in of guaranteed benefits for substantial owners. Guaranteed benefits are based on the vested accrued benefits of the plan participants. In calculating the guaranteed benefit, remember that changes in vesting schedule, normal retirement age, and normal form of annuity payment are all considered as changes in benefit amount that are subject to the phase in rules.

If there were a change in normal form of benefits, you would have to normalize the benefits. Normalization is the process of converting benefits available under earlier sets of plan provisions to equivalent benefit amounts based on the plan provisions in effect at date of plan termination (DOPT). This is a necessary step; otherwise you would be comparing apples and oranges.

The PBGC maximum monthly guaranteed benefit (MGB) is defined as the lesser of the adjusted ERISA §4022(b) value, or the highest five year consecutive compensation. The MGB is defined assuming payment on a life annuity basis at age 65.

The MGB should be adjusted based on the age at DOPT. Based on page 72 of the PBGC study note, it is correct to age adjust the MGB, even when it is based on the highest five year compensation.

Another key point of the problem is that the maximum guaranteed benefit limit (MGB) must be reduced for benefit commencement ages before 65. The 2004 MGB at 65 is 3,698.86 (from the tables given with the exam). The reduction factor given in the table for age 62 is 79%:

$$\text{2004 MGB at 62} \quad 2,922.10 = 3,698.86(.79)$$

Note that the benefit formula uses elapsed-time service. You should be cautious any time the day and month of hire are different than the day and month of exit:

10/01/2004 Age	62
Past service	$28.75 = 2004.75 - 1976.00$
Plan accrued benefit	$3,162.50 = 28.75(110)$

The key point to the problem is that Smith is a substantial owner. The 01/01/80 plan benefit is subject to the 30 year phase-ins. These are measured from the later of the effective date, or Smith's date of hire, which is 01/01/80. The number of full years for the 30 year phase-in is  $24 = 2004 - 1980$ .

## 2004 EA-2B Exam Solutions

---

### Problem 28 - Page 2

	Smith: 30 year phase-ins
Date of birth	10/01/42
10/01/04 age	62
Date of hire	01/01/76
Past service (elapsed time)	28.75
Substantial owner?	YES
Vesting percentage	100%
01/01/80 Base plan benefit	3,162.50
Guaranteeable benefit increase	2,922.10 (limited by MGB)
Years plan has been in effect	24
Phase-in	$2,337.68 = (24/30) * (2922.10)$
Total guaranteed benefit	2,337.68

One point of the guaranteed benefit calculation is that you can't phase in any benefits that exceed the MGB.

**Answer is B**

## 2004 EA-2B Exam Solutions

---

### Problem 29

Similar to 2003 #32
---------------------

The key to this problem is knowing what "the longest waiver period permitted" means. This refers to the election period for the qualified pre-retirement spouse annuity (QPSA). In 417(a)(6)(B), it defines the applicable election period for the QPSA as starting on the first day of the plan year in which the participant attains age 35. The period ends on the date of death.

In 417(c)(1)(A)(ii), if the participant dies prior to their earliest retirement age, the annuity should commence at that earliest retirement age. Smith did not have 25 years of service at death. Their spouse's benefit will commence at the date Jones would have attained NRA 65.

#### As of 01/01/2004

Age	49
Service	24
Earliest Retirement Age	65

Accrued Benefit	7,200
	$= 1\%(24)(30,000)$

50% J&S Reduction	90%
50% J&S Benefit	6,480
50% Death benefit	3,240

Election period starts	Age 35
	01/01/1990
QPSA coverage period	14

QPSA reduction	2.8%
	$= .2\%(14)$

Death benefit to spouse	3149.28
	$= (1-.028)(3,240)$

**Answer is D**

This problem was quite forgiving. You get the correct answer range even if you incorrectly reduced the benefit for 21 years of QPSA coverage!

## 2004 EA-2B Exam Solutions

---

### Problem 30

Revised 04/25/07

This question tests your understanding of when a 204(h) notice is required. In general, notice is required for an amendment that either

1. Significantly reduces the rate of future benefit accrual, or
2. Eliminates or significantly reduces early retirement benefit, or a retirement type subsidy

The items given for the four defined benefit plans clearly require a 204(h) notice. The other two plans are not quite as clear.

In general, 204(h) notices are only required for defined benefit plans. Q-6 of the 54.4980F regulation discusses individual account plans. The only type of individual account plan subject to a 204(h) notice is a plan subject to the minimum funding standard under IRC Section 412. Money purchase plans are the only type of individual account plan subject to the minimum funding standard under IRC Section 412.

An amendment to an individual account plan reduces the rate of future benefit accrual only if it is reasonably expected that the amendment will reduce the amount of contributions or forfeitures allocated for any future year. As a result, the change to Plan F requires a 204(h) notice.

The change to Plan E does not require a 204(h) notice, since it is for a profit sharing plan, or for a 401(k) plan. That type of individual account plan is not subject to the 204(h) notice requirement.

Five of the six plan amendments require a 204(h) notice.

**Answer is E**

## 2004 EA-2B Exam Solutions

---

### Problem 31

Similar to 2000 #1
--------------------

You are doing the 410(b) average benefit percentage test (ABPT) for Plan A. Plan A's plan year ends 01/31/2004. You need to aggregate all the benefit percentages of the employer's plans to do the ABPT calculations.

For the ABPT, employee benefit percentages should be determined based on plan years ending in the same calendar year. See the regulation at 1.410(b)-5(d)(3).

B's plan year ending in 2004 is 10/31/2004.

**Answer is D**

## 2004 EA-2B Exam Solutions

---

### Problem 32

Similar to 2000 #45

In event of termination, a defined benefit plan must limit benefits of HCEs (or former HCEs) to amount that is not discriminatory under 401(a)(4). The regulation at 1.401(a)(4)-5(b)(3) contains the rules regarding restricted distributions. In general, it says the employee can't receive more than one year's life annuity payments in a year.

There are several exceptions to this distribution restriction at 1.401(a)(4)-5(b)(3)(iv)(A):

- After payment, plan assets  $\geq$  110% of current liability under 412(l)(7)
- Value of benefits payable  $<$  1% of current liability
- Value of benefits payable  $<$  411(a)(11)(A) mandatory L.S. amount (5,000)

To satisfy the requirements of the regulation, the assets after Smith's distribution need to be at least  $110\% * 99,015,000 = 108,916,500$ . The problem asks for the amount of assets prior to Smith's lump sum. You need to calculate Smith's distribution is based on his termination age of 65:

Plan lump sum basis

	Plan basis	417(e)(3) basis
Interest rate	4.00%	4.60%
Mortality table	UP-84	Applicable
Lump sum factor	10.82	12.20

The lump sum factor used must be the greater of the plan basis, or the minimum lump sum basis under 417(e)(3). The resulting lump sum is  $1,220,000 = 100,000(12.20)$ .

The assets prior to Smith's distribution were  $110,136,500 = 1,220,000 + 108,916,500$ .

**Answer is D**



## 2004 EA-2B Exam Solutions

---

### Problem 33 - Page 1

Similar to 2002 #27
---------------------

This is a long problem on calculations involving imputed permitted disparity and the average benefit percentage test (ABPT).

The ABPT is defined under the regulations at §1.410(b)-5 as the ratio of the actual benefit percentage (ABP) for non-highly compensated employees (NHCEs) who benefit under the plan divided by the ABP for highly compensated employees (HCEs) who benefit under the plan.

There are several items to consider regarding imputed permitted disparity:

- You can't impute permitted disparity on any 401(k) deferrals (for cross-tested plans)
- There are two different calculations that vary based on compensation level
- The annual permitted disparity factor (APDF) varies based on SSRA

There are different calculations for the imputed permitted disparity based on whether the average annual compensation exceeds covered compensation.

For employees with average annual compensation above covered compensation, you must calculate the "C rate" and the "D rate", and use the lesser of the rates. These are defined at 1.401(a)(4)-7(c)(3) as:

<b>C Rate</b>	<b>D Rate</b>
$\frac{\text{ER provided accrual}}{\text{avg. annual comp} - \frac{1}{2} (\text{covered comp.})}$	$\frac{\text{ER provided accrual} + (\text{permitted disparity factor}) * (\text{covered comp.})}{\text{Average annual compensation}}$

You are given the accrual rates for each participant. The benefit accrual (for the calculations above) equals the accrual rate multiplied by the average annual compensation.

For DB plans, the annual permitted disparity factor (APDF) is .75%, based on retirement at SSRA. This assumes use of the PDF tables that vary by SSRA. This problem tells you that the simplified table is not used.

In this problem the testing age is 65. You must reduce the APDF to allow for the difference (if any) between age 65 and each employee's SSRA.

The APDF is defined as zero after 35 years. This prevents longer service employees from exceeding the cumulative permitted disparity limit under 1.401(l)-5(c)(1). The permitted disparity factor (PDF) is defined at 1.401(a)(4)-7(c)(4)(iii)(A), as follows:

$$\text{PDF} = (\text{sum of annual PDF}) / (\text{testing service during measurement period})$$

**Problem 33 - Page 2****Revised 03/24/06**

You are told that all employees have less than 35 years of testing service. In this problem, you do not need to adjust the APD to allow for testing service in excess of 35 years.

The first step is to determine the adjusted normal accrual rate (NAR) for the HCEs. Then you do similar calculations for each of the NHCEs. Once you have all the adjusted accrual rates, you can do the ABPT calculations.

**HCE1**

This employee has an SSRA of 65, so the APDF of .75% does not have to be adjusted for the testing age of 65. The PDF equals the .75% APDF.

Now you can calculate the C rate and the D rate, as described earlier. The NAR adjusted for imputed permitted disparity is 1.85%, the lesser of the C rate and the D rate:

$$\begin{aligned}\text{C rate (NAR)} &= 1.88\% = 1.70\%(200,000) / [200,000 - .5(39,000)] \\ \text{D rate (NAR)} &= 1.85\% = [1.70\%(200,000) + .75\%(39,000)] / 200,000\end{aligned}$$

**HCE2**

This employee has an SSRA of 67, so the APDF of .75% must be adjusted for the testing age of 65. The APDF for retirement at 65 with SSRA of 67 is .65% (from the table given with the exam). The PDF equals the .65% APDF.

The NAR adjusted for imputed permitted disparity is 1.95%, the lesser of the C rate and the D rate:

$$\begin{aligned}\text{C rate (NAR)} &= 2.11\% = 1.70\%(200,000) / [200,000 - .5(78,000)] \\ \text{D rate (NAR)} &= 1.95\% = [1.70\%(200,000) + .65\%(78,000)] / 200,000\end{aligned}$$

**NHCE1**

This employee has an SSRA of 65, so the APDF of .75% does not have to be adjusted for the testing age of 65. The PDF equals the .75% APDF.

The NAR adjusted for imputed permitted disparity is 1.06%, the lesser of the C rate and the D rate:

$$\begin{aligned}\text{C rate (NAR)} &= 1.06\% = .80\%(80,000) / [80,000 - .5(39,000)] \\ \text{D rate (NAR)} &= 1.17\% = [.80\%(80,000) + .75\%(39,000)] / 80,000\end{aligned}$$

## 2004 EA-2B Exam Solutions

---

### Problem 33 - Page 3

#### NHCE2

This employee has an SSRA of 66, so the APDF of .75% must be adjusted for the testing age of 65. The APDF for retirement at 65 with SSRA of 66 is .70% (from the table given with the exam). The PDF equals the .70% APDF.

For employees with average annual compensation  $\leq$  covered compensation, you must calculate the “A rate” and the “B rate”, and use the lesser of the rates. The unadjusted accrual rate is either the NAR or MVAR without imputing permitted disparity.

#### **A Rate**

$2 * \text{unadjusted accrual rate}$

#### **B Rate**

$\text{unadjusted accrual rate} + \text{permitted disparity rate}$

These calculations are much simpler than those for the other participants. The NAR adjusted for imputed permitted disparity is 1.50%, the lesser of the A rate and the B rate:

$$\text{A rate (NAR)} = 1.60\% = 2 * .80\%$$

$$\text{B rate (NAR)} = 1.50\% = .80\% + .70\%$$

#### NHCE3

This employee has an SSRA of 67, so the APDF of .75% must be adjusted for the testing age of 65. The APDF for retirement at 65 with SSRA of 67 is .65% (from the table given with the exam). The PDF equals the .65% APDF.

The NAR adjusted for imputed permitted disparity is 1.45%, the lesser of the A rate and the B rate:

$$\text{A rate (NAR)} = 1.60\% = 2 * .80\%$$

$$\text{B rate (NAR)} = 1.45\% = .80\% + .65\%$$

## 2004 EA-2B Exam Solutions

---

### Problem 33 - Page 4

#### Average Benefits Percentage Test

The ABPT result equals the ratio of the average benefit percentage for the NHCEs divided by the average for the HCEs:

	NHCEs	HCEs
Sum of rates	1.06% + 1.50% + 1.45%	1.85% + 1.95%
Average	1.34%	1.90%

The ABPT result is the ratio:  $70.32\% = 1.34\% / 1.90\%$

**Answer is C**

## 2004 EA-2B Exam Solutions

---

### Problem 34

The key to this problem is knowing the effect of a partial termination. In IRC 411(d)(3), it states that upon a termination or partial termination, rights to accrued benefits at that date for the affected employees become 100% vested to the extent funded.

In this problem, you are told that the market value of assets at 01/01/2004 covers 100% of the benefit liabilities. You are also told that the partial termination applies to participants who terminated at 01/01/2004. That means that it does not apply to Smith, who terminated employment at 01/01/2003.

This means that Jones and Brown are 100% vested due to the partial termination. Smith was 20% vested at exit, based on the plan's vesting schedule. The remainder of the problem is the benefit calculations:

	Smith	Jones	Brown
Age	44	44	44
Benefit Service	3	5	2
Monthly accrued benefit	90	150	60
Vested percentage	20%	100%	100%
Vested accrued benefit	18	150	60

The sum of the vested benefits for all three participants is 228. The total present value of vested benefits is

$$16,416 = 12(228)(6.00)$$

**Answer is C**

## 2004 EA-2B Exam Solutions

---

### Problem 35

This problem tests your knowledge of the 1.417(e)-1 regulation. In IRC 417(e)(3), it states the basis for calculation of present values as "applicable mortality table" and "applicable interest rate".

But not all optional forms of payment are subject to this requirement. At 1.417(e)-1(d)(6), there are some exceptions to this requirement:

“... does not apply to the amount of a distribution under a non-decreasing annuity payable for a period not less than the life of the participant or, in the case of a QPSA, the life of the surviving spouse. A non-decreasing annuity includes a QJSA, QPSA, and an annuity that decreases merely because of the cessation or reduction of Social Security supplements or qualified disability payments (as defined in §411(a)(9)).”

The lump sum and the 5-year certain annuity are not paid over the lifetime of the participant. The third optional form that is also subject to the 417(e)(3) requirement is the Social Security level income option. The reason is that it is a decreasing annuity.

**Answer is D**

### Problem 36 - Page 1

Revised 04/25/07

This problem tests some small details regarding waivers for PBGC reportable events.

#### I. TRUE

There is a reportable event when the participant count is less than 80% of the prior year's count, or less than 75% of the value two years ago.

$$80\%(160) = 128$$

$$75\%(180) = 135$$

Reporting of this event is waived if it meets any of these definitions:

- Small plan exception
- Funding-based waivers

Since the participant count of 130 is less than 135, there is a reportable event for Plan I.

The plan is not eligible for the funding based waiver due to the variable rate premium that is due for the current year. The plan is not eligible for the small plan exception, since there are at least 100 participants for both the current plan year and the previous plan year.

#### II. FALSE

The first catch is that this distribution might not meet the definition of a reportable event. You don't have enough information to be sure that it meets the last criteria:

1. There is a distribution to a substantial owner
2. The total of all distributions to the substantial owner within the one-year period ending with the date of such distribution exceeds \$10,000
3. The distribution is for a reason other than the owner's death, and
4. Immediately after the distribution, the plan has unfunded nonforfeitable benefits.

Reporting of this event is waived if it meets any of these definitions:

- Distribution up to \$415 limit
- Funding-based waivers
- Distribution up to 1% of assets

The reporting is waived based on the fact that the plan has no variable rate premium for 2004. This is one of the three funding based waivers.

### Problem 36 - Page 2

#### III. FALSE

It is clear that the transfer of assets and liabilities meets the reportable event definition. Reporting of this event is waived if it meets any of these definitions:

- Complete plan transfer
- De minimis transfer
- §414(l) safe harbor
- Fully-funded plans

Based on the description of the assumptions used, this asset transfer meets the definition of the §414(l) safe harbor:

"The transfer complies with Code §414(l) using the actuarial assumptions prescribed for valuing benefits in terminated PBGC-trusted plans under 29 CFR §4044.51-57."

Only Plan I has a reportable event.

**Answer is B**



## 2004 EA-2B Exam Solutions

---

### Problem 37 - Page 1

Revised 05/02/05

This is a fairly typical problem on 415. This tests your ability to calculate the 415 limits under EGTRRA. The first step is calculation of the plan benefit without the 415 limits.

#### As of 01/01/2004:

Age	55	Birth date	01/01/49
Service	7 years	Hire date	01/01/97
Participation	6 years	Entry date	01/01/97

This final average earnings includes pay for the final three plan years (2001 to 2003):

Final average earnings at 01/01/04 =  $120,000 = (120,000 + 120,000 + 120,000) / 3$   
Each year's pay limited by 401(a)(17)

Accrued benefit at age 55 =  $120,000 * 11.0\% * 7$   
= 92,400

Early retirement benefit at 55 =  $92,400 * [1 - 6.0\% * (60 - 55)]$   
= 64,680

This benefit must be adjusted to the 15 year certain and life optional form elected using this factor:  $\ddot{a}_{55}^{(12)} / \ddot{a}_{55:\overline{15}|}^{(12)}$

Factor on plan basis 8.5% UP-84 = .9360 = 9.584 / 10.239  
Age 55 benefit on 15 yr C&C basis =  $64,680 * .9360$   
= 60,542

#### **415 compensation limit**

The second step is calculation of the §415 compensation limit. Earnings used for the §415 compensation limit are not subject to the §401(a)(17) limit. The §415(b)(1)(B) compensation limit is reduced when service is less than ten years.

100% 3 year comp. §415 limit =  $120,000 = (120,000 + 120,000 + 120,000) / 3$

Reduced §415 compensation limit =  $84,000 = 120,000 * (7/10)$

#### **415 dollar limit**

The third step is calculation of the §415 dollar limit under §415(b)(1)(A). The dollar limit is reduced when participation is less than ten years. Under EGTRRA, the dollar limit is available unreduced between ages 62 and 65.

## 2004 EA-2B Exam Solutions

---

### Problem 37 - Page 2

$$\begin{aligned}\$415 \text{ dollar limit at age 62} &= 165,000 * (6/10) \\ &= 99,000\end{aligned}$$

#### 415 dollar limit - reduction prior to age 62

§415(b)(2)(E)(i) says to use the greater of 5% and the interest rate specified in the plan to reduce the \$415 dollar limit prior to age 62, but here the code is misleading. The examples in Revenue Ruling 98-1 clarify that the \$415 dollar limit is reduced using the lower of the factors calculated based on the mandated mortality and interest rate, and the plan basis for actuarial equivalence.

In this problem, you are given the factors for  $\ddot{a}_{55}^{(12)}$  and  $\ddot{a}_{62}^{(12)}$  on several bases. Since your death benefit equals 100% of the present value of the accrued benefit, you should use the  $v^7(\ddot{a}_{62}^{(12)} / \ddot{a}_{55}^{(12)})$  factors to reduce the dollar limit prior to age 62. With this death benefit, there is no risk of forfeiting the benefit, and there is no mortality risk involved.

$$\text{Actuarial reduction from 62 to 55} = v^7 (\ddot{a}_{62}^{(12)} / \ddot{a}_{55}^{(12)})$$

$$\text{Mandated basis 5.0\% "applicable"} = .6183 = .7107 * (12.6800 / 14.5740)$$

One detail in this problem is the definition of the actuarial reduction before age 62 on the plan basis. This problem gives you both percent per year age reduction factors, and plan actuarial equivalence factors. It is not entirely clear how this situation is handled in practice. Here is the wording in Step 2 of Q&A 7 of Revenue Ruling 98-1:

"If the age at which the benefit is payable is less than 62, the age-adjusted dollar limit is determined by reducing the age-adjusted dollar limit at age 62 on an actuarially equivalent basis. In general, sections 415(b)(2)(E)(i) and (v) require that the reduced age-adjusted dollar limit be the lesser of the equivalent amount computed using the plan rate and plan mortality table (or plan tabular factor) used for actuarial equivalence for early retirement benefits under the plan and the amount computed using 5 percent interest and the applicable mortality table (used to the extent described in Q&A-6)."

This implies we should use the percent per year early retirement reductions for actuarial reduction of the 415 dollar limit on the plan basis. When given both sets of factors, I would only use the actuarial equivalence factors if the problem identified these as "for actuarial equivalence for early retirement benefits under the plan".

You are told that the plan's early retirement reduction is 6.0% per year before age 60. The example in Q-9 of Revenue Ruling 98-1 calculates the actuarial reduction on the plan basis as the ratio of the plan's "tabular" reduction factor at the early retirement age to the factor at age 62.

## 2004 EA-2B Exam Solutions

---

### Problem 37 - Page 3

Revised 05/02/05

$$\begin{aligned}\text{Actuarial reduction from 62 to 55} &= \text{ERF}_{55} / \text{ERF}_{62} \\ \text{(plan "tabular" basis)} &= [1 - .06(60-55)] / [1 - .06(60-60)] \\ &= .7000\end{aligned}$$

The calculation of  $\text{ERF}_{62}$  looks a little fishy. The problem gives the plan's normal retirement age as 60. You really don't know what the reduction factor is beyond age 60.

I have calculated the ratio of the two factors assuming the reduction factor is 1.0 at all ages 60 and higher. It is basically immaterial, since the mandated basis reduction factor will normally be lower, due to the 5% interest rate.

$$\begin{aligned}\$415 \text{ dollar limit at age 55} &= 99,000 * \text{lesser of } [.7000 \text{ or } .6183] \\ &= 61,214\end{aligned}$$

$$\text{Final \$415 limit at age 55} = 61,214 = \text{lesser of } 61,214 \text{ and } 84,000$$

### 415 Limit on 15 year Certain and Life basis

The final step is to determine the actuarial equivalent of the final 415 limit on the normal form basis, and to compare this to the plan early retirement benefit. The normal form is a 15 year certain and life annuity. The adjustment factor is the life annuity factor divided by the 15 year certain and life annuity factor:  $\ddot{a}_{55}^{(12)} / \ddot{a}_{55:\overline{15}|}^{(12)}$

The examples in Revenue Ruling 98-1 clarify that the \$415 limit is adjusted using the lower of the factors calculated using the mandated mortality and interest rate, and the plan basis for actuarial equivalence. In general, the adjustment of the 415 limit for payment form on the mandated basis uses the 5% interest rate. When the form of payment is subject to 417(e)(3), such as a certain only annuity, or a lump sum, the mandated basis uses the applicable interest rate instead of the 5% interest.

$$\text{Plan basis 8.5\% UP-84} = .9360 = 9.584 / 10.239$$

$$\text{Mandated basis 5.0\% "applicable"} = .9730 = 14.574 / 14.979$$

$$\begin{aligned}415 \text{ limit on 15 yr C\&C basis} &= 61,214 * \text{lesser of } [.9360 \text{ or } .9730] \\ &= 57,298\end{aligned}$$

Smith's plan benefit of 60,542 is limited to the 415 limit on 15 yr C&C basis of 57,298.

**Answer is C**

## 2004 EA-2B Exam Solutions

---

### Problem 38

Similar to 2001 #36

Revised 04/29/19

In general, the Top Heavy (T-H) determination date is the last day of the preceding plan year. An exception to this is the first plan year, when the determination date is the last day of the first plan year. To determine if the defined benefit plan is T-H for the plan year starting July 1, 2004, the determination date would be June 30, 2004.

Both plans are part of a required 416 aggregation group, since they both include at least one key employee. You must combine the two plans to determine the T-H status. If the entire aggregation group is T-H, then each of the plans would also be T-H for the year. Question T-23 of the 1.416-1 regulation requires you to use determination dates that fall within the same calendar year (2004). The 2004 determination date for the profit sharing plan is December 31, 2004.

Based on questions T-24 and T-25, the present value of accrued benefits for the DB plan (or account balance for the DC plan) is calculated as of the valuation date in the 12 month period ending on the determination date. For the DB plan, you would use the results at the July 1, 2003 valuation date. For the DC plan, you would use the results at December 31, 2004.

The last point of the problem is that Brown is a former key employee. As such, they should be excluded completely from the T-H ratio calculation.

Once you have identified the valuation dates for both plans, you can do the T-H determination.

	DB Plan	DC Plan	Sum
2004 Determination date	06/30/04	12/31/04	
Valuation date within prior 12 months	07/01/03	12/31/04	
Key employees	225,000 + 230,000	350,000 + 425,000	1,230,000
Non-key employees	700,000	650,000	1,350,000

The Top heavy ratio is

$$47.67\% = 1,230 / (1,230 + 1,350)$$

**Answer is C**

There are two key points to this problem. One is if you know the definition of "current availability". The other key point is the special exception for handling a time-limited eligibility.

**I. Ratio percentage test**

The ratio percentage is defined under the regulations at §1.410(b)-9 as the percentage of non-highly compensated employees (NHCEs) who benefit under the plan divided by the percentage of highly compensated employees (HCEs) who benefit under the plan:

$$\text{Ratio \% test: } \frac{\left( \frac{\text{NHCEs who benefit}}{\text{Total Non-excludable NHCEs}} \right)}{\left( \frac{\text{HCEs who benefit}}{\text{Total Non-excludable HCEs}} \right)}$$

The percentage of NHCEs who benefit under the plan equals the number of NHCEs in the plan divided by the total number of non-excludable NHCEs. The percentage of HCEs who benefit under the plan equals the number of HCEs in the plan divided by the total number of non-excludable HCEs.

$$\begin{aligned} \text{Ratio \% test} &= [24 / 40] / [39 / 40] \\ &= 61.54\% \end{aligned}$$

**II. Ratio of percentages - employees for whom Window benefit is currently available**

The regulation at 1.401(a)(4)-4 contains definitions and rules for nondiscriminatory availability of benefits rights and features. For a benefit to satisfy the "currently available" requirement for a plan year, the group of employees for whom the benefit is "currently available" must satisfy IRC 410(b). This determination is made ignoring the average benefits percentage test under 1.410(b)-5.

1.401(a)(4)-4(b)(2)(i) states the general rule is that any determination is "based on the current facts and circumstances with respect to the employee." 1.401(a)(4)-4(b)(2)(ii)(A)(1) states that "any specified age and service condition with respect to an optional form of benefit or a social security supplement is disregarded in determining whether the optional form of benefit or social security supplement is currently available."

## 2004 EA-2B Exam Solutions

---

### Problem 39 - Page 2

Revised 04/21/09

The early retirement window lasts from July 1, 2004 to December 31, 2004. This is a time-limited eligibility. The special exception in the regulation states that you do not ignore "any specified age and service condition with respect to" a time-limited eligibility.

$$\begin{aligned}\text{Window ratio} &= [(5+4) / 40] / [(15+2) / 40] \\ &= 52.94\%\end{aligned}$$

### III. Safe harbor percentage

1.410(b)-4(c)(4) defines the Safe and Unsafe harbor percentages based on the non-highly compensated concentration percentage (NHCCP). The NHCCP is defined under the regulations at §1.410(b)-4(c)(4)(iii) as the ratio of non-excludable NHCEs to total non-excludable employees.

$$\begin{aligned}\text{NHCCP} &= 40 / (40+40) \\ &= 50.0\%\end{aligned}$$

Using the table provided with the exam, the safe harbor percentage is also equal to 50%.

$$\begin{array}{ccccc} \text{I} & > & \text{II} & > & \text{III} \\ 61.54\% & > & 52.94\% & > & 50.00\% \end{array}$$

**Answer is A**

#### NOTE:

The regulation defines the NHCCP as "for all employees of the employer." For the NHCCP, the regulation states that the excludable employees are the same as under the ABPT, which uses "all plans in the testing group."

## 2004 EA-2B Exam Solutions

---

### Problem 40 - Page 1

Similar to 2003 #37

#### Withdrawal occurred in 2003

Under the Rolling Five Method, the calculation of withdrawal liability is relatively simple. Assuming the withdrawal occurred in 2003, you should use the UVB at 12/31/2002. Employer A's share of the 12/31/2002 UVB is based on the ratio of employer A's contributions to the total contributions in the prior five years.

YEAR:	1998	1999	2000	2001	2002
ER share=	$850,000 * ($	$45,000 +$	$45,000 +$	$55,000 +$	$55,000 +$
	$($	$375,000 +$	$375,000 +$	$475,000 +$	$475,000 +$
	$)$	$)$	$)$	$)$	$)$
ER share =	$850,000 * \frac{255,000}{2,175,000}$				
=	99,655				

After determining Employer A's share of the UVB, the de minimis amount must be calculated. Then a deductible is calculated based on the amount of the de minimis and the employer's share of the UVB. The final withdrawal liability is calculated as the employer's share less the deductible.

The mandatory de minimis is the lesser of 50,000 or 3/4% of the plan's total UVB (.0075 \* 850,000 = 6,375). The deductible is the de minimis amount reduced by the excess of the allocated UVB over 100,000. The deductible is 6,375 less zero, or 6,375. The final employer withdrawal liability is 99,655 - 6,375 = 93,280 = X.

#### Withdrawal occurred in 2004

Assuming the withdrawal occurred in 2004, you should use the UVB at 12/31/2003. Employer A's share of the 12/31/2003 UVB is based on the ratio of employer A's contributions to the total contributions in the prior five years.

YEAR:	1999	2000	2001	2002	2003
ER share=	$900,000 * ($	$45,000 +$	$55,000 +$	$55,000 +$	$55,000 +$
	$($	$375,000 +$	$475,000 +$	$475,000 +$	$500,000 )$
	$)$	$)$	$)$	$)$	$)$
ER share =	$900,000 * \frac{270,000}{2,300,000}$				
=	105,652				

## 2004 EA-2B Exam Solutions

---

### Problem 40 - Page 2

After determining Employer A's share of the UVB, the de minimis amount must be calculated. Then a deductible is calculated based on the amount of the de minimis and the employer's share of the UVB. The final withdrawal liability is calculated as the employer's share less the deductible.

The mandatory de minimis is the lesser of 50,000 or  $3/4\%$  of the plan's total UVB ( $.0075 * 900,000 = 6,750$ ). The deductible is the de minimis amount reduced by the excess of the allocated UVB over 100,000. The deductible is 6,750 less  $(105,652 - 100,000)$ , or 1,098. The final employer withdrawal liability is  $105,652 - 1,098 = 104,554 = Y$ .

The difference between X and Y is  $11,274 = 104,554 - 93,280$ .

**Answer is C**



## 2004 EA-2B Exam Solutions

---

### Problem 41

Revised 12/29/05

The key to this problem is whether you are familiar with DOL Interpretive Bulletin 95-1, which corresponds to 29 CFR 2509.95-1. This bulletin explains the fiduciary standards outlined in Act Section 404 of ERISA. It is discussed in connection with plan terminations on pages 45 and 46 of the PBGC study note.

#### I. TRUE

Not choosing the safest annuity goes against the basic concept of fiduciary responsibility. But there does seem to be allowance for a choice between annuities that have nearly the same level of safety, but a large difference in cost.

In section (d) of DOL Interpretive Bulletin 95-1, it states:

"The Department recognizes that there are situations where it may be in the interest of the participants and beneficiaries to purchase other than the safest available annuity. Such situations may occur where the safest available annuity is only marginally safer, but disproportionately more expensive than competing annuities, and the participants and beneficiaries are likely to bear a significant portion of that increased cost."

#### II. FALSE

The conflict of interest results from the fact that the least expensive annuities will produce the largest reversion to the employer. If the fiduciaries are employees of the employer, they may prefer the most expensive annuity provider. The reason is that the safest insurers (with the highest claims-paying ability) tend to have the most expensive annuities.

So far, it sounds like item II is true. The thing that makes it false is that it implies that fiduciaries always have a conflict of interest. As described earlier that is not necessarily true.

#### III. FALSE

It does not make sense that the wishes of a participant would override a fiduciary's responsibility under ERISA.

Only item I is True.

**Answer is B**

## 2004 EA-2B Exam Solutions

---

### Problem 42

This is the first question asked on the EA-2B exam on the actual calculations to test if a 414(s) compensation definition is discriminatory. The exam question refers to "the individual method". At 1.414(s)-1(d)(3)(i), it describes the test for an alternative definition of compensation:

"(3) Nondiscrimination requirement—(i) In general. An alternative definition of compensation under this paragraph (d) is nondiscriminatory under section 414(s) for a determination period if the average percentage of total compensation included under the alternative definition of compensation for an employer's highly compensated employees, as a group for the determination period does not exceed by more than a de minimis amount the average percentage of total compensation included under the alternative definition for the employer's nonhighly compensated employees as a group."

The key to the problem is the handling of the 401(a)(17) limit. In the last sentence of 1.414(s)-1(d)(3)(ii), it states that the total compensation must be limited by 401(a)(17):

"Total compensation taken into account for each employee (including, if added, the elective contributions and deferred compensation described in paragraph (c)(4) of this section) may not exceed the annual compensation limit of section 401(a)(17)."

	Annual Rate of Pay	Limited by 401(a)(17)	Base pay	Bonuses	Overtime	Total pay	Limited by 401(a)(17)	Ratio of Rate of pay to Total pay
HCE1	102,000	102,000	97,000	14,000	0	111,000	111,000	91.89%
HCE2	207,000	200,000	196,000	19,000	0	215,000	200,000	100.00%
NHCE1	25,000	25,000	24,000	0	3,000	27,000	27,000	92.59%
NHCE2	30,000	30,000	29,000	1,000	3,000	33,000	33,000	90.91%
NHCE3	50,000	50,000	47,000	7,000	0	54,000	54,000	92.59%

The average percentage for the HCEs is 95.95%, and the average percentage for the NHCEs is 92.03%. The difference between the average percentages is 3.92%

**Answer is E**

NOTE:

The de minimis amount used in the test at 1.414(s)-1(d)(3)(i) is based on facts and circumstances.

## 2004 EA-2B Exam Solutions

---

### Problem 43

Similar to 2003 #38

Revised 04/05/10

This is the second question on the exam on the calculation of the amount of excise taxes due to prohibited transactions. This is covered in Revenue Ruling 2002-43, which was added to the EA-2B reading list in 2003.

The revenue ruling covers the situation where you have a prohibited transaction that spans multiple years that also involves a loan. In that case, a new prohibited transaction is deemed to occur at the beginning of each successive taxable year (for the duration of the original prohibited transaction).

This problem is simpler than the example used in the revenue ruling, since it does not involve a loan over multiple years. The loan interest for 2003 was 6% for 9 months on 1,000,000. The excise tax penalty rate is currently 15%.

$$\text{Loan interest} = 45,000 = (9/12) * 6\% * (1,000,000)$$

$$\text{Excise tax} = 6,750 = 15\% * 45,000$$

**Answer is C**

THIS PAGE WAS INTENTIONALLY LEFT BLANK