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CHAPTER 4

SHORTFALL AMORTIZATION CHARGES

Under the PPA funding method, a plan sponsor funds the plan's liabilities – that is, the plan participants' accrued benefits - in the year the benefits accrue under the plan. Now, if the plan's liabilities grow at exactly the assumed rate for funding, and the assets grow by the same rate, then the plan's assets would always equal the plan's Funding Target, and the plan's Target Normal Cost would be the employer's contribution in each year.

But of course, the plan's liabilities and assets do not always grow at the assumed rate of interest, and it is possible that the plan provides benefits based on years of service before the plan is established, and so could not have been funded by past TNC contributions.

Since TNC is the value of benefits accruing in the current year, annual contributions of TNC will only cover future benefit accruals, and can fall behind plan liabilities if the plan has experience losses. If, as of any valuation date, the plan assets are less than the plan's FT, the difference in these amounts creates a funding shortfall, and the shortfall must be funded in addition to the TNC for the year. This chapter focuses on these shortfall charges and how they are treated by PPA (and, more importantly, how they are treated in EA-2A exam questions).

TRANSITION RULE

For purposes of the shortfall amortization charges to a plan, PPA divided all single employer plans into two categories:

Plans subject to the transition rule under IRC §430(c)(5)(B). Plans fall into this group if the plan was in existence prior to the first plan year that begins in 2008 (the first plan year to which the funding method under PPA applies) – **and** – the plan was not, in the final plan year prior to PPA (the 2007 plan year), subject to the additional funding charge imposed on underfunded plans under IRC §412(1). Note that **both** of these two conditions must be true for plans to fall into this group.

Plans that are not subject to the transition rule under IRC §430(c)(5)(B). (These plans are subject to the general rules of PPA without the transition modification.) Plans fall into this group if the plan meets **either** of the following two criteria: 1) the plan is adopted and effective with the first plan year beginning in 2008 or later; or 2) the plan was in existence in 2007, and was subject to the additional funding charge under IRC §412(1) in the 2007 year.

NOTE: For purposes of the EA-2A exam, you are to assume that plans were not subject to §412(1) in any prior years. Question data may specify that the plan was or was not so subject, but if the information is not explicitly given, you are to assume the plan was NOT so subject. You are not to assume that a plan was effective either prior to or after the plan year that begins in 2008.

An exam question may state directly a plan's effective date. The question may also imply such effective date. For example, if a question states that a plan has or has ever had a COB, then the plan **must** have existed prior to the 2008 plan year. A question may also state that a plan has

assets as of the start of the 2008 plan year, which would also imply that the plan received contribution and was effective prior to the 2008 year.

If an exam question does not state the plan has a COB and it is not clear whether the plan existed prior to 2008 and so there is no way to tell if the transition rule should be applied, you should solve the question anyway. It is possible that you will arrive at the correct answer whether the transition rule applies or not, and so the question is valid, even though the applicability of the transition rule is not clear. However, you should note the question. If the answer to the question hinges upon the applicability of the transition rule, and the applicability cannot be determined from the question data, there may be a legitimate basis to dispute the official answer to the question.

A plan which is subject to the transition rule multiplies the funding target by 92% in 2008, 94% in 2009, and 96% in 2010, when determining the shortfall amount for these years. Plans which are not subject to the transition rule (including all plans adopted and initially effective in 2008 or later) always use 100% of the funding target in determining the funding shortfall. Beginning in plan years beginning in 2011 and later, all plans (including those subject to the transition rule) use 100% of the funding target for this purpose. Like other aspects of the PPA that had a phase-in period beginning in 2008, the transition rule will have less and less importance on future exams.

The effect of the transition rule is that it makes it easier for a plan to avoid establishing a funding shortfall amortization base in the plan years beginning in 2008, 2009, and 2010. Prior to the passage of WREERA in December of 2008, plans that were in the group subject to the transition rule had to meet the criteria to not establish such a base in order to remain subject to the transition rule. For example, a plan subject to the transition rule in 2008 that was required to establish a shortfall amortization base in 2008 was not subject to the transition rule in 2009 or 2010. WREERA changed this rule, retroactively to the start of the 2008 plan year. For exam purposes, you should treat all plans eligible for the transition rule as having applied such rule in all 2008, 2009 and 2010 plan years.

ADJUSTED ASSETS

As mentioned in chapter 1, there are three different ways to adjust (reduce) the actuarial value of plan assets for the existence of a COB and/or PFB under the plan. Two of these adjusted asset values are needed to determine the existence of and amount of a funding shortfall amortization base. As before, the type of adjustment to the assets will be referred to by reference to the paragraph ((A), (B), or (C)) under Code §430(f)(4).

Adjusted assets A. To determine adjusted assets under §430(f)(4)(A), it is necessary to know whether a plan will apply any portion of the PFB to reduce the MRC for the plan year. For adjusted assets A, the actuarial value of assets is reduced by the PFB if, and only if, some portion of the PFB will be used to reduce the MRC. If no portion of the PFB will be used to reduce MRC, then there is no adjustment – and so adjusted assets A is equal to the actuarial value of assets. Assets are never reduced by a plan's COB for purposes of adjusted assets A. If a plan has no PFB, adjusted assets A is equal to the plan's actuarial value of assets, regardless of whether the plan does or does not have a COB at the start of the plan year.

Notice that in 2008 (the first plan year to which the PPA funding rules will apply), the plan's PFB by definition is \$0. Pre-existing plans may have a COB, but cannot have any PFB. Therefore,

adjusted assets A will always be equal to the plan's actuarial value of assets in the plan year beginning in 2008.

The value of adjusted assets A is used to determine whether a plan must establish a funding shortfall amortization base in a given plan year.

Adjusted assets B. To calculate the value of adjusted assets under §430(f)(4)(B), both the COB and the PFB are subtracted from the plan's actuarial value of assets as of the first day of the year. Both balances are always subtracted in full, there is no exception with regard to whether the plan will use either or both balances to reduce the plan's MRC for the year.

It can be seen that the value of adjusted assets B must always be equal to or less than the value of adjusted assets A, described above. Also, the value of adjusted assets B will be equal to the actuarial value of assets if, and only if, the value of the COB and the PFB are \$0 at the start of a plan year.

The value of adjusted assets B is used to determine the amount of a funding shortfall amortization base in years in which such a base is established. In addition, this definition of adjusted assets is used to calculate the plan's Funding Target Attainment Percentage (FTAP), which is used to determine whether a plan is in at-risk status (see Chapter 7).

As you can imagine, the use of two different versions of adjusted assets - one to establish and another to determine the amount of a shortfall amortization base - can be confusing and can lead to unexpected results, as will be addressed later in this chapter.

DETERMINING THE SHORTFALL AMORTIZATION CHARGE

There are several steps to be taken in this process - all of which you will be required to understand and to perform in solving questions on the exam.

Step 1. Determine whether a shortfall amortization base exists. The plan must compare the value of adjusted assets A to a value equal to a percentage of the plan's FT for the year.

The percentage of FT used for comparison in this step depends on whether the plan is or is not subject to the §430(c)(5)(B) transition rule. If the plan is subject to this transition rule, then the percentage is 92% in 2008, 94% in 2009, 96% in 2010, and 100% in all years thereafter.

If a plan is not subject to the transition rule, the value of adjusted assets A is always compared to 100% of the FT calculated for the year.

Step 2. Calculate the current year's funding shortfall by subtracting adjusted assets B from the applicable percentage of the FT. Again, the percentage of the funding target to be used is determined with respect to whether or not the plan is subject to the transition rule described above. The percentages are the same as listed above, 92% in 2008, 94% in 2009, 96% in 2010, and 100% in all years thereafter if the plan is eligible for the transition rule and 100% at all times otherwise.

Remember from Chapter 1 that Adjusted Assets A are always equal to or greater than Adjusted Assets B. Therefore, it is possible that even if a plan has a funding shortfall (based on Adjusted

Assets B), the plan may not be required to establish a funding shortfall base (because of Adjusted Assets A).

Example. On the 1/1/2011 valuation, a plan has assets of \$100,000, a FT of \$95,000, COB of \$10,000, and PFB of \$10,000. The plan will not apply any portion of the PFB to the minimum required contribution in 2011. The plan's adjusted assets A is \$100,000, because neither the COB nor the PFB are subtracted from the actuarial value of assets, since no portion of the PFB is being applied to the MRC. Adjusted assets B is \$80,000, because both COB and PFB are subtracted for this purpose in all cases. Since adjusted assets A is greater than 100% of the FT, the plan is not required to establish a shortfall amortization base, even though the plan has a funding shortfall (100% of FT minus adjusted assets B) of \$20,000.

In this example, if the plan sponsor did apply any portion of the PFB to reduce the 2011 MRC, then the value of adjusted assets A would drop to \$90,000 (assets minus full value of PFB, regardless of what portion of the PFB is so applied). This value is less than the FT by \$5,000, although this exact amount is irrelevant. As long as adjusted assets A is less than FT by even a very small amount, the full funding shortfall of \$20,000 (based on adjusted assets B) will be recognized for the valuation.

Step 3. The value of the funding shortfall for a plan year is reduced by the present value of any remaining payments on existing shortfall amortization bases from prior years to determine this year's shortfall amortization base. **Important Note:** Under this step, the shortfall can be reduced below zero, to establish a negative funding shortfall base and a negative funding shortfall installment.

The establishment of a negative installment in a given year should be thought of as an indication that the plan's shortfall amortization charge from previous years is now considered too large (based on current interest rates, FT, and plan assets) under the funding method, and the negative installment is the funding method's way of reducing the overall shortfall amortization charge to the plan.

Once determined, the shortfall amortization base for the current year's valuation is divided by the 7-year amortization factor to determine the shortfall amortization installment. The shortfall amortization charge for the year is the sum of the shortfall amortization installments for the current and all still outstanding prior years.

Each year, the funding segment interest rates that are used to amortize a shortfall base will change as mandated by law. The installment required to amortize the base is not recalculated using the new interest rates. Instead, the present value of the remaining payments is re-calculated using the new interest rates. Once established, the funding shortfall installment for a given plan year remains the same in all future years.

The present value of remaining shortfall amortization installments is calculated using the X-year present value factor for the number of years remaining on such installment.

For example, assume a plan has a funding shortfall amortization charge for the years 2008 and 2009, and is required to set up a shortfall amortization base in 2010. The present value of the remaining payments for the 2008 and 2009 amortization bases is found by multiplying the 2008 installment by the 5-year amortization factor, since there are five payments left for such installment, and the present value of the remaining six 2009 installments is found by multiplying the installment charge by the 6-year amortization factor. The present value factors for the 7-year,

6-year, 5-year, and any other needed amortization factors are all calculated using the same three tiered segment interest rates used for the 2010 valuation.

X-YEAR SHORTFALL AMORTIZATION PRESENT VALUE FACTORS.

Suppose, for a plan valuation performed on 1/1/2010, the three segment interest rates are 5.0%, 6.0%, and 7.0%. The plan has existing shortfall amortization installments from the 2008, 2009 and 2010 plan years, and is required to establish a new base in 2011.

To perform the 1/1/2011 valuation, the plan actuary will need to calculate a 4-year amortization factor (to determine the present value of the remaining 2008 installment payments), a 5-year amortization factor (to calculate the present value of the remaining 2009 installment payments), a 6-year amortization factor (to calculate the present value of the remaining 2020 installment payments), and, finally, a 7-year amortization factor (to determine the 2011 shortfall amortization charge, once the amount of the shortfall amortization base is known).

Note: It is questionable whether an exam question would require a candidate to perform this many manual calculations on a single question. Perhaps the question will provide shortcuts, such as directly providing the 4-year, 5-year, 6-year, and 7-year factors rather than asking the candidate to calculate each based on the segment rates. Exam questions that require a lot of manual calculations, of course, will have a larger point value than questions that can be answered more quickly.

Still, this problem will grow on future exams as the PPA ages. By the 2014 exam, there could be a full six prior amortization payments that must be valued at different factors representing all of the one through six year factors. It remains to be seen how the exam writers will address this issue.

Based on the first two segment rates of 5% and 6% (the third segment rate is not considered, since no installment payments are more than 20 years in the future), the following chart demonstrates how these factors are determined.

Pmt #	PV formula	PV result	cumulative sum
1	(immediate payment)	1.0000	1.0000 (1-year present value factor)
2	$1/1.05$	0.9524	1.9524 (2-year present value factor)
3	$1/1.05^2$	0.9070	2.8594 (3-year present value factor)
4	$1/1.05^3$	0.8638	3.7232 (4-year present value factor)
5	$1/1.05^4$	0.8228	4.5460 (5-year present value factor)
6*	$1/1.06^5$	0.7472	5.2932 (6-year present value factor)
7	$1/1.06^6$	0.7050	5.9982 (7-year present value factor)

*Note that the sixth installment, due exactly 5 years after the valuation date, is computed under the second segment rate, and not the first. This is the accepted interpretation of the law (which is not perfectly clear whether a payment exactly five years away should be valued at the first or second segment rate) under the IRS final regulations on Code Section 430 funding rules. Since 2008, EA-2A exam questions have consistently provided all X-year present value factors needed to answer a question, rather than forcing a candidate to calculate it in the above manner. However, now that the IRS regulations have been published for over a year, the 2011 exam may require the candidate to make such a calculation.

DEEMED EARLY AMORTIZATION OF SHORTFALL BASES

In any year where the adjusted assets B is greater than 100% of the FT on the plan's valuation date, there is no shortfall amortization base established for the year, and all outstanding amortization bases established in prior years are deemed to be fully amortized for purposes of the current and all future plan years. There is no funding installment charge the plan year if this deemed amortization occurs.

EXAMPLES

The following examples demonstrate the above rules. In all of the following examples, the valuation date is 1/1/2012. For all questions, the first two segment rates are 5% and 6%, and the shortfall amortization factors are 4.5460 for 5-year, 5.2932 for 6-year, and 5.9982 for 7-year. In each question, there is no shortfall amortization installment for any year prior to 2010.

For each example, determine the total shortfall amortization charge for the 2010 plan year.

1. Plan will use PFB to offset MRC - yes
 - 1/1/2012 valuation FT - \$600,000
 - Actuarial value of assets - \$540,000
 - 1/1/2012 COB - \$ 20,000
 - 1/1/2012 PFB - \$ 30,000
 - 2010 shortfall amort installment - \$ 50,000
 - 2011 shortfall amort installment - \$ (15,000)

2. Plan will use PFB to offset MRC - yes
 - 1/1/2012 valuation FT - \$600,000
 - Actuarial value of assets - \$611,000
 - 1/1/2012 COB - \$ 20,000
 - 1/1/2012 PFB - \$ 10,000
 - 2010 shortfall amort installment - \$ 0
 - 2011 shortfall amort installment - \$ 50,000

3. Plan will use PFB to offset MRC - yes
 - 1/1/2012 valuation FT - \$1,000,000
 - Actuarial value of assets - \$1,200,000
 - 1/1/2012 COB - \$ 0
 - 1/1/2012 PFB - \$ 120,000
 - 2010 shortfall amort installment - \$ 85,000
 - 2011 shortfall amort installment - \$ (70,000)

4. Plan will use PFB to offset MRC - yes
 - 1/1/2012 valuation FT - \$600,000
 - Actuarial value of assets - \$620,000
 - 1/1/2012 COB - \$ 30,000
 - 1/1/2012 PFB - \$ 40,000
 - 2010 shortfall amort installment - \$ 30,000
 - 2011 shortfall amort installment - \$ (20,000)

5. Plan will use PFB to offset MRC - no
 1/1/2012 valuation FT - \$600,000
 Actuarial value of assets - \$620,000
 1/1/2012 COB - \$ 30,000
 1/1/2012 PFB - \$ 40,000
 2010 shortfall amort installment - \$ 30,000
 2011 shortfall amort installment - \$ (20,000)

6. Plan will use PFB to offset MRC - no
 1/1/2012 valuation FT - \$800,000
 Actuarial value of assets - \$400,000
 1/1/2012 COB - \$ 0
 1/1/2012 PFB - \$ 0
 2010 shortfall amort installment - \$120,000
 2011 shortfall amort installment - \$ 30,000

7. Plan will use PFB to offset MRC - yes
 1/1/2012 valuation FT - \$1,200,000
 Actuarial value of assets - \$ 480,000
 1/1/2012 COB - \$ 50,000
 1/1/2012 PFB - \$ 20,000
 2010 shortfall amort installment - \$ 50,000
 2011 shortfall amort installment - \$ 40,000

8. Plan will use PFB to offset MRC - no
 1/1/2012 valuation FT - \$576,000
 Actuarial value of assets - \$590,000
 1/1/2012 COB - \$ 40,000
 1/1/2012 PFB - \$ 0
 2010 shortfall amort installment - \$ 50,000
 2011 shortfall amort installment - \$ (15,000)

9. Plan will use PFB to offset MRC - no
 1/1/2012 valuation FT - \$576,000
 Actuarial value of assets - \$575,000
 1/1/2012 COB - \$ 40,000
 1/1/2012 PFB - \$ 0
 2010 shortfall amort installment - \$ 50,000
 2011 shortfall amort installment - \$ (15,000)

SOLUTIONS

1. Because the plan will apply the PFB to MRC for the year, the assets are reduced by PFB (\$540,000 - \$30,000 = \$510,000) and compared to FT of \$600,000. Assets are less, and a new base is established.

Adjusted assets B = \$540,000 - \$20,000 - \$30,000 = \$490,000
 Funding shortfall = \$600,000 - \$490,000 = \$110,000
 PV 2010 installments = \$50,000 x 4.5460 = \$227,300
 PV 2011 installments = (\$15,000) x 5.2932 = (\$79,398)

$$\begin{aligned} 2012 \text{ shortfall amortization base} &= \$110,000 - \$227,300 - (\$79,398) = (\$37,902) \\ 2012 \text{ shortfall amortization installment} &= (\$37,902) / 5.9982 = (\$6,319) \end{aligned}$$

The 2012 shortfall amortization charge is $\$50,000 + (\$15,000) + (\$6,319) = \$28,681$.

2. Compare the assets as reduced by PFB ($\$611,000 - \$10,000 = \$601,000$) to FT of $\$600,000$. Assets are greater, and the plan is exempt from establishing a new base in 2012.

However, 100% of the FT ($\$600,000$) is greater than the value of assets reduced by both COB and PFB ($\$611,000 - \$20,000 - \$10,000 = \$581,000$). The deemed amortization of all prior year bases does not occur. The existing installment from 2011 must still be included in the amortization charge.

The 2012 shortfall amortization charge is $\$50,000$.

3. Compare the assets as reduced by PFB ($\$1,200,000 - \$120,000 = \$1,080,000$) to FT of $\$1,000,000$. Assets are greater, and the plan is exempt from establishing a new base in 2012.

Also, 100% of the FT ($\$1,000,000$) is less than the value of assets reduced by both COB and PFB ($\$1,200,000 - \$0 - \$120,000 = \$1,080,000$). The complete amortization of all prior year bases is deemed to occur.

The 2012 shortfall amortization charge is $\$0$.

4. The plan sponsor elects to apply the PFB to the MRC. Assets must be adjusted by the PFB ($\$620,000 - \$40,000 = \$580,000$) before they are compared to the FT of $\$600,000$. Assets are less, and a new base is established.

$$\begin{aligned} \text{Adjusted assets B} &= \$620,000 - \$30,000 - \$40,000 = \$550,000 \\ \text{Funding shortfall} &= \$600,000 - \$550,000 = \$50,000 \\ \text{PV 2010 installments} &= \$30,000 \times 4.5460 = \$136,380 \\ \text{PV 2011 installments} &= (\$20,000) \times 5.2932 = (\$105,864) \\ 2012 \text{ shortfall amortization base} &= \$50,000 - \$136,380 - (\$105,864) = \$19,484 \\ 2012 \text{ shortfall amortization installment} &= \$19,484 / 5.9982 = \$3,248 \end{aligned}$$

The 2012 shortfall amortization charge is $\$30,000 + (\$20,000) + \$3,248 = \$13,248$.

5. The question is similar to the previous question, except that in this case the plan sponsor does elect to apply at least some portion of the PFB to the MRC. Because of this election, assets are not adjusted by the PFB ($\$620,000$) before they are compared to 100% of the FT ($\$600,000$). Because the PFB is not subtracted from the asset value, assets are greater than FT and no base is established for 2012.

But, as in question 2, 100% of the FT ($\$600,000$) is greater than the value of assets reduced by both COB and PFB ($\$620,000 - \$30,000 - \$40,000 = \$550,000$). The deemed amortization of all prior year bases does not occur. The existing installments from 2010 and 2011 will apply in 2012 and possibly in future plan years (if the shortfall is not eliminated).

The 2012 shortfall amortization charge is $\$30,000 + (\$20,000) = \$10,000$.

The data in questions 4 and 5 are identical, other than the plan sponsor's decision to apply portion of the existing PFB against the MRC for the year. The two questions indicate the importance of the decision (and the importance of the actuary knowing the decision, prior to running the plan valuation), and how such decision can affect the funding charge for the year.

6. In this question, there is no COB or PFB by which to reduce the actuarial value of assets. The adjusted value of assets, determined under any definition, are equal to the actuarial value of assets. The actuarial value of assets is still less than 100% of the FT, and a 2012 base must be established.

Adjusted assets B = actuarial value of assets = \$400,000
 Funding shortfall = $\$800,000 - \$400,000 = \$400,000$
 PV 2010 installments = $\$120,000 \times 4.5460 = \$545,520$
 PV 2011 installments = $\$30,000 \times 5.2932 = \$158,796$
 2012 shortfall amortization base = $\$400,000 - \$545,520 - \$158,796 = (\$304,316)$
 2012 shortfall amortization installment = $(\$304,316) / 5.9982 = (\$50,735)$

The 2012 shortfall amortization charge is $\$120,000 + \$30,000 + (\$50,735) = \$99,265$

7. Plan sponsor elects to apply the PFB to the MRC. Assets adjusted by the PFB ($\$480,000 - \$20,000 = \$460,000$) before they are compared to the FT of $\$1,200,000$. Assets are less, and a new base is established.

Adjusted assets B = $\$480,000 - \$50,000 - \$20,000 = \$410,000$
 Funding shortfall = $\$1,200,000 - \$410,000 = \$790,000$
 PV 2010 installments = $\$50,000 \times 4.5460 = \$227,300$
 PV 2011 installments = $\$40,000 \times 5.2932 = \$211,728$
 2012 shortfall amortization base = $\$790,000 - \$227,300 - \$211,728 = \$350,972$
 2012 shortfall amortization installment = $\$350,972 / 5.9982 = \$58,513$

The 2012 shortfall amortization charge is $\$50,000 + \$40,000 + \$58,513 = \$148,513$.

8. Plan sponsor does not elect to apply the PFB to the MRC. The full value of plan assets ($\$590,000$) is compared to the FT of $\$576,000 \times 96\% = \$576,000$. Assets are greater, and a no new base is established.

The value of plan assets reduced by COB ($\$590,000 - \$40,000 = \$550,000$; there is no PFB) is compared to 100% of the FT ($\$576,000$). Assets are less, and so the existing bases from 2010 and 2011 are not deemed fully amortized, and compose the entire funding shortfall charge for the 2012 valuation

The 2012 shortfall amortization charge is $\$50,000 + (\$15,000) = \$35,000$.

9. Plan is eligible for the transition rule. The plan has no PFB, so the sponsor cannot elect to apply the PFB to the MRC. With the PFB equal to \$0, the full actuarial value of assets (\$575,000) is compared to the FT of \$576,000. Assets are less, and a new base is established.

$$\text{Adjusted assets B} = \$575,000 - \$40,000 - \$0 = \$535,000$$

$$\text{Funding shortfall} = \$576,000 - \$535,000 = \$41,000$$

$$\text{PV 2010 installments} = \$50,000 \times 4.5460 = \$227,300$$

$$\text{PV 2011 installments} = (\$15,000) \times 5.2932 = (\$79,398)$$

$$\text{2012 shortfall amortization base} = \$41,000 - \$227,300 - (\$79,398) = (\$106,902)$$

$$\text{2012 shortfall amortization installment} = (\$106,902) / 5.9982 = (\$17,822)$$

The 2012 shortfall amortization charge is $\$50,000 + (\$15,000) + (\$17,822) = \$17,178$

The data here is very similar to the data in question 8. In this case, the only difference is that assets are \$15,000 lower than in question 8. The assets are reduced just enough so that the plan is not exempt from establishing a funding shortfall amortization base. The base that is established is negative, and reduces the shortfall amortization charge.

This question, compared to question 8, shows the unexpected (and perhaps unintended) results of the interplay in using one set of rules to determine whether to establish a funding shortfall base, and another to determine the amount of such a shortfall amortization base. In this case, we see the funding method cause a plan with lower assets (in question 9) to have a smaller funding charge than the plan with greater assets (in question 8).

This may not have been the Congress' intent in passing PPA and WRERA, but it is the result. Since the interplay of these rules is not likely to be addressed anytime soon, the best that actuaries can do is be prepared to see unusual results of this type, both when working on actual plans and theoretical valuations on EA exams.

EXTENDED EXAMPLE

This is an example to demonstrate how the shortfall amortization charge is developed year by year, with the calculation expanding in each successive year. In this example, the plan existed prior to 2008, when the plan first became subject to the PPA funding method. The plan was underfunded at the start of 2008, and has remained underfunded in all years from 2008-2013. No balance has ever been placed into either the Carryover Balance or the Pre-Funding Balance.

For all years, the first and second segment interest rates are 5% and 6%, so that the present value factors for all years are: 7-Year: 5.9982; 6-Year: 5.2932; 5-Year: 4.5460; 4-Year: 3.7232; 3-Year: 2.8594; 2-Year: 1.9524; and 1-Year: 1.000 (see the table earlier in this chapter for how these factors are developed).

The funding target and actuarial value of assets for the plan over the 2008-2013 valuations are given in this table:

Year	Funding Target	Plan Assets	Shortfall Amortization Charge
2008	1,000,000	900,000	???
2009	1,200,000	600,000	???
2010	1,400,000	900,000	???
2011	1,600,000	1,100,000	???
2012	1,800,000	1,400,000	???
2013	2,000,000	1,800,000	???

The year by year shortfall amortization charge amounts are determined as follow:

2008:

Funding shortfall: $\$1,000,000 \times 92\% - \$900,000 = \$20,000$

Shortfall Amortization Charge: $\$20,000 / 5.9982 = \$3,334$

2009:

Funding shortfall: $\$1,200,000 \times 94\% - \$600,000 = \$528,000$

PV 2008 installment: $\$3,334 \times 5.2932 = \$17,648$

2009 Base: $\$528,000 - \$17,648 = \$510,352$

Shortfall Amortization Installment: $\$510,352 / 5.9982 = \$85,084$

Shortfall Amortization Charge: $\$3,334 + \$85,084 = \$88,418$

2010:

Funding shortfall: $\$1,400,000 \times 96\% - \$900,000 = \$444,000$

PV 2008 installment: $\$3,334 \times 4.5460 = \$15,156$

PV 2009 installment: $\$85,084 \times 5.2932 = \$450,367$

2010 Base: $\$444,000 - \$15,156 - \$450,367 = (\$21,523)$

Shortfall Amortization Installment: $(\$21,523) / 5.9982 = (\$3,588)$

Shortfall Amortization Charge: $\$3,334 + \$85,084 - \$3,588 = \$84,830$

2011:

Funding shortfall: $\$1,600,000 - \$1,100,000 = \$500,000$

PV 2008 installment: $\$3,334 \times 3.7232 = \$12,413$

PV 2009 installment: $\$85,084 \times 4.5460 = \$386,792$

PV 2010 installment: $(\$3,588) \times 5.2932 = (\$18,992)$

2011 Base: $\$500,000 - \$12,413 - \$386,792 - (\$18,992) = \$119,787$

Shortfall Amortization Installment: $\$119,787 / 5.9982 = \$19,970$

Shortfall Amortization Charge: $\$3,334 + \$85,084 - \$3,588 + \$19,970 = \$104,800$

2012:

Funding shortfall: $\$1,800,000 - \$1,400,000 = \$400,000$

PV 2008 installment: $\$3,334 \times 2.8594 = \$9,533$

PV 2009 installment: $\$85,084 \times 3.7232 = \$316,785$

PV 2010 installment: $(\$3,588) \times 4.5460 = (\$16,311)$

PV 2011 installment: $\$19,970 \times 5.2932 = \$105,705$

2012 Base: $\$400,000 - \$9,533 - \$316,785 - (\$16,311) - \$105,705 = (\$15,712)$

Shortfall Amortization Installment: $(\$15,712) / 5.9982 = (\$2,619)$

Shortfall Amortization Charge: $\$3,334 + \$85,084 - \$3,588 + \$19,970 - \$2,619 = \$102,181$

2013:

Funding shortfall: $\$2,000,000 - \$1,800,000 = \$200,000$

PV 2008 installment: $\$3,334 \times 1.9524 = \$6,509$

PV 2009 installment: $\$85,084 \times 2.8594 = \$243,289$

PV 2010 installment: $(\$3,588) \times 3.7232 = (\$13,359)$

PV 2011 installment: $\$19,970 \times 4.5460 = \$90,784$

PV 2012 installment: $(\$2,619) \times 5.2932 = (\$13,863)$

2013 Base: $\$200,000 - \$6,509 - \$243,289 - (\$13,359) - \$90,784 - (\$13,863) = (\$113,360)$

Shortfall Amortization Installment: $(\$113,360) / 5.9982 = (\$18,899)$

Shortfall Amortization Charge: $\$3,334 + \$85,084 - \$3,588 + \$19,970 - \$2,619 - \$18,899 = \$83,282$

A few points can be picked up from this example. You can see that each year's installment is determined less by the gross underfunding of the plan and more by the single year increase in underfunding since the prior year. The largest installment occurs in 2009, and is owing to the large drop in plan assets during the 2008 calendar year. The second largest installment occurs in 2011, owing largely to the end of the phase-in period, when the percentage of FT considered increases from 96% to 100%.

In this example, the 2008 installment would still be used to calculate the 2014 shortfall charge, but the 2008 installment will drop off the calculation for 2015, since the 2008 base will be fully paid and remaining payments will have a present value of \$0. Since the shortfall bases are amortized over a seven year period, the maximum number of installments added to create a shortfall charge is normally seven, representing installments for the current and six prior plan years.

THE PENSION RELIEF ACT OF 2010 (PRA)

In the above example, a large decrease in assets in the 2008 calendar year caused a huge jump in the installment charge (and, correspondingly, the mandatory minimum contribution for the year) in 2009 (a second, smaller increase occurs in 2011, when the FT phase-in period expires – otherwise, the amortization charge remains more or less stable over the years shown).

The fact pattern in this example matches the actual experience of many plans – the declining market conditions in 2008 caused many plans to experience a large loss in assets in the 2008 calendar year. To ease the increased pension funding costs generated by such losses, Congress passed a pension funding relief act in 2010 (PRA) designed to reduce the amortization shortfall costs in 2009 and later years. Because of the timing of the passage of this act, its provisions could not be included in creating questions for the 2010 EA-2A exam, but it will most likely affect one or more questions on the 2011 exam.

In early 2011, the IRS published Notice 2011-3, providing detailed rules regarding pension funding relief. Exam candidates are encouraged to read this Notice in full. The provisions of the Notice are summarized here.

Under PRA, an employer may elect to substitute one of two extended amortization schedules for the normal 7-year level payment amortization under PPA. The two alternative schedules are known as the 2+7 schedule, and the 15-year amortization schedule. Under the 2+7 schedule, the first two annual amortization payments are calculated by multiplying the funding shortfall base for the year by the plan's effective interest rate (this term is defined and explained in the following chapter 5). The next seven payments are calculated as a level installment such that the present value of the entire nine year schedule of payments is equal to the amortization base amount. Under the 15-year schedule, the payment is a level payment over 15 years, rather than the 7 years under the regular PPA amortization calculation.

EXAMPLE

In the detailed example shown above, the 2009 shortfall amortization base is \$510,532, and the shortfall amortization installment is \$85,084. How would this installment be changed if the employer plan sponsor were to choose to apply an alternative schedule under PRA? Assume the first two segment rates are 5% and 6%, as in the above example, and the 2009 effective interest rate is 6.25%.

2+7 Schedule. The calculation of the shortfall amortization base is unchanged. The shortfall amortization installments for 2009 and 2010 will each be equal to $\$510,352 \times 6.25\% = \$31,897$. The present value of these two payments is subtracted from the base to determine the present value of the remaining seven installment payments, and the payments themselves are developed as follows:

$$\begin{aligned} \text{Remaining Base: } & \$510,352 - \$31,897 \times (1 + 1/1.05) = \$448,077 \\ \text{Present Value of remaining seven payments: } & 1/1.05^2 + 1/1.05^3 + 1/1.05^4 + 1/1.06^5 + 1/1.06^6 + \\ & 1/1.06^7 + 1/1.06^8 = 5.3383 \\ \text{Payments: } & \$448,077 / 5.3383 = \$83,936 \end{aligned}$$

15-Year Schedule. Under the 15 year schedule, the calculation is:

$$\begin{aligned} \text{Present Value of payments: } & 1 + 1/1.05 + 1/1.05^2 + 1/1.05^3 + 1/1.05^4 + 1/1.06^5 + 1/1.06^6 + 1/1.06^7 \\ & + 1/1.06^8 + 1/1.06^9 + 1/1.06^{10} + 1/1.06^{11} + 1/1.06^{12} + 1/1.06^{13} + 1/1.06^{14} = 10.3758 \\ \text{Installments: } & \$510,352 / 10.3758 = \$49,187 \end{aligned}$$

In both cases, in future years the present value of the remaining 2009 installment payments will be calculated using the altered amortization schedule, either the varying payments under the remaining nine year schedule or the level payments over the remaining 15 year schedule. Thus, the 15-year schedule would continue to affect funding calculations through the 2023 plan year valuation (or the year in which the plan becomes fully funded).

EFFECT OF PRA

It can be seen that the use of one of the two alternative amortization schedules provides a mixed benefit, reducing the payment immediately required but increase payments down the road. Under the 15-year schedule, the shortfall installment of \$85,084 is reduced to \$49,187, an immediate savings of \$35,897 to the plan sponsor, but extending payments 8 more years into the future. This is the same type of tradeoff as reducing a mortgage payment by extending the period from 15 to 30 years, for example.

The 2+7 schedule reduces the immediately payable installment even more, from \$85,084 to \$31,897, a decrease of \$53,187 in the employer's current minimum required contribution.. However, these two additional payments only delay the start of the seven year installment payment of roughly the same amount.

ADDITIONAL RULES UNDER PPA

The election to use an alternative amortization schedule under the PRA is available for plan years beginning in 2008, 2009, 2010, and 2011. However, for 2008 the option is available only to plans with a 2008 funding deadline on or before the date of passage of the act, July 25, 2010.

Therefore, the option for plan years beginning in 2008 is only available if the 2008 year begins in late October, or November or December of 2008. For calendar year plans, the default for exam questions, the option is only available in the 2009, 2010, and 2011 years.

The option to use the extended amortization period may be exercised no more than two of the three (or four) years in which it is available. Plans which exercise the PRA option twice *must* use the same schedule in both years, under the terms of the law.

Finally, plans which use the extended amortization schedule option under PRA must make an additional payment in a year in which the employer pays compensation of over \$1 million to any employee, or declares stock dividends of over \$1 million. The extra payment is the amount by which compensation or dividend amounts exceed \$1 million, and the terms of such additional payment are given in IRS Notice 2011-3.

The PRA also eased the additional payments required for multi-employer plans that do not fund under the PPA funding method. The effect of PRA on multi-employer plans will be discussed further in chapter 10.

REVIEW QUESTIONS

- 4-1. Credit balance in the funding standard account as of 12/31/2007: \$0.
2008 segment rates: (5%, 5%, 6%).
2009 segment rates: (6%, 6%, 7%).

Selected valuation result as of 1/1/2008:

Shortfall amortization charge	\$185,000
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Selected valuation results as of 1/1/2009:

Funding target	\$11,000,000
Actuarial (market) value of assets	9,840,000

The contribution for the 2008 plan year was equal to the **smallest amount that satisfies the minimum funding standard** for the 2008 plan year.

In what range is the total shortfall amortization charge as of 1/1/2009?

- (A) Less than \$100,000
- (B) \$100,000 but less than \$104,000
- (C) \$104,000 but less than \$108,000
- (D) \$108,000 but less than \$112,000
- (E) \$112,000 or more