

SECTION 430

Minimum Funding Examples

Single Employer Plans

SHORTFALL AMORTIZATION EXAMPLES

- **EXAMPLE #1**
 - a. Overview of all calculations
 - b. Shortfall amortizations
 - c. New shortfall base, and exemption
 - d. Elimination of shortfall bases

- **EXAMPLE #2 - page 20**
 - a. Similar to #1
 - b. Effect of change in yield curve

- **EXAMPLE #3 - page 38**
 - a. Simplified example
 - b. Assume 5% for asset and liability growth, and each yield curve rate

SHORTFALL AMORTIZATION

EXAMPLE #1 - 2008

INITIAL VALUES

Carryover balance 0

Prefunding balance 0

AAV 360,000

Funding target 402,000

Target NC 40,200

ASSUMPTIONS

Yearly liability growth 4%

Yearly asset growth 7%

Ignore “at-risk” provisions

Shortfall amortization base exemption

Assume this plan is eligible for applicable percentage < 100%

Summary of results on page 18

SHORTFALL AMORTIZATION

EXAMPLE #1 - 2008

Funding Shortfall

Funding Target - (AAV - CB - PB)

$$42,000 = 402,000 - (360,000 - 0 - 0)$$

EXEMPT FROM NEW S/F BASE?

Modified Assets: AAV - PB or AAV - 0
360,000

Applicable percentage 92%

Modified funding target

$$369,840 = 92\% * 402,000$$

“Modified Funding Shortfall”

$$9,840 = 369,840 - 360,000$$

NOT exempt – must set up new S/F base

SHORTFALL AMORTIZATION BASE WRERA

EXAMPLE #1 - 2008

Funding Shortfall Base definition

(Applicable percentage)*(Funding Target)
minus (AAV-CB-PB) minus O/S Shortfall bases

PV of prior years' S/F amortizations: Zero

Applicable percentage 92%

New Shortfall Base

$$9,840 = 92\% * 402,000 - (360,000 - 0 - 0) - 0$$

SHORTFALL AMORTIZATION EXAMPLE #1 - 2008

New S/F installment

$$1,597 = 9,840 / 6.1596$$

Total S/F amortization charge

$$1,597$$

Minimum required contribution (MRC)

Target NC + S/F amortization charge

$$41,797 = 40,200 + 1,597$$

Yield curve rates:

4.0% for 5 years, 5.0% for 15 years, then 6.0%

$$\begin{aligned} 6.1596 &= \ddot{a}_{\overline{5}|.04} + (\ddot{a}_{\overline{7}|.05} - \ddot{a}_{\overline{5}|.05}) \\ &= \underbrace{1 + v^1 + v^2 + v^3 + v^4}_{\text{Using 4.0\%}} + \underbrace{v^5 + v^6}_{\text{then 5.0\%}} \end{aligned}$$

SHORTFALL AMORTIZATION

EXAMPLE #1 - 2009

Assets: assume contrib. = prior year MRC
 $429,923 = 1.07 * (360,000 + 41,797)$

Funding Target
 $459,888 = 1.04 * (402,000 + 40,200)$

Target Normal Cost
 $41,808 = 1.04 * (40,200)$

SHORTFALL AMORTIZATION

EXAMPLE #1 - 2009

Funding Shortfall

Funding Target - (AAV - CB - PB)

$$29,965 = 459,888 - (429,923 - 0 - 0)$$

EXEMPT FROM NEW S/F BASE?

Modified Assets: AAV - PB or AAV - 0
429,923

Applicable percentage 94%

Modified funding target
 $432,295 = 94\% * 459,888$

“Modified Funding Shortfall”
 $2,371 = 432,295 - 429,923$

NOT exempt – must set up new S/F base

SHORTFALL AMORTIZATION BASE WRERA

EXAMPLE #1 - 2009

Funding Shortfall Base definition

(Applicable percentage)*(Funding Target)
minus (AAV-CB-PB) minus O/S Shortfall bases

PV of prior years' S/F amortizations:

$$8,648 = 1,597 * 5.4134$$

Applicable percentage 94%

New Shortfall Base

$$(6,277) = 94\% * 459,888 - (429,923 - 0 - 0) - 8,648$$

Yield curve rates:

4.0% for 5 years, 5.0% for 15 years, then 6.0%

$$\begin{aligned} 5.4134 &= \ddot{a}_{\overline{5}|.04} + (\ddot{a}_{\overline{6}|.05} - \ddot{a}_{\overline{5}|.05}) \\ &= \underbrace{1 + v^1 + v^2 + v^3 + v^4 + v^5}_{\text{Using 4.0\% then 5.0\%}} \end{aligned}$$

SHORTFALL AMORTIZATION EXAMPLE #1 - 2009

New S/F installment

$$(1,019) = (6,277) / 6.1596$$

Total S/F amortization charge

$$579 = 1,597 + (1,019)$$

Minimum required contribution (MRC)

Target NC + S/F amortization charge

$$42,387 = 41,808 + 579$$

Yield curve rates:

4.0% for 5 years, 5.0% for 15 years, then 6.0%

$$\begin{aligned} 6.1596 &= \ddot{a}_{\overline{5}|.04} + (\ddot{a}_{\overline{7}|.05} - \ddot{a}_{\overline{5}|.05}) \\ &= \underbrace{1 + v^1 + v^2 + v^3 + v^4}_{\text{Using 4.0\%}} + \underbrace{v^5 + v^6}_{\text{then 5.0\%}} \end{aligned}$$

SHORTFALL AMORTIZATION

EXAMPLE #1 - 2010

Assets: assume contrib. = prior year MRC
 $505,372 = 1.07*(429,923 + 42,387)$

Funding Target
 $521,764 = 1.04*(459,888 + 41,808)$

Target Normal Cost
 $43,480 = 1.04*(41,808)$

SHORTFALL AMORTIZATION

EXAMPLE #1 - 2010

Funding Shortfall

Funding Target - (AAV - CB - PB)

$$16,392 = 521,764 - (505,372 - 0 - 0)$$

EXEMPT FROM NEW S/F BASE?

- CB = PB = 0
- Modified AAV → no change

Applicable percentage 96%

Modified funding target

$$500,893 = 96\% * 521,764$$

“Modified Funding Shortfall”

$$0 = 500,893 - 505,372$$

Exempt – NO new S/F base

SHORTFALL AMORTIZATION EXAMPLE #1 - 2010

New S/F installment

$$0 = 0 / 6.1596$$

Total S/F amortization charge

$$579 = 1,597 + 0 + (1,019)$$

Minimum required contribution (MRC)

Target NC + S/F amortization charge

$$44,059 = 43,480 + 579$$

Yield curve rates:

4.0% for 5 years, 5.0% for 15 years, then 6.0%

$$\begin{aligned} 6.1596 &= \ddot{a}_{\overline{5}|.04} + (\ddot{a}_{\overline{7}|.05} - \ddot{a}_{\overline{5}|.05}) \\ &= \underbrace{1 + v^1 + v^2 + v^3 + v^4}_{\text{Using 4.0\%}} + \underbrace{v^5 + v^6}_{\text{then 5.0\%}} \end{aligned}$$

Using 4.0% then 5.0%

SHORTFALL AMORTIZATION

EXAMPLE #1 - 2011

Assets: assume contrib. = prior year MRC
 $587,890 = 1.07*(505,372 + 44,059)$

Funding Target
 $587,854 = 1.04*(521,764 + 43,480)$

Target Normal Cost
 $45,220 = 1.04*(43,480)$

SHORTFALL AMORTIZATION

EXAMPLE #1 - 2011

Funding Shortfall

Funding Target - (AAV - CB - PB)

$$0 = 587,854 - (587,890 - 0 - 0)$$

EXEMPT FROM NEW S/F BASE?

Applicable percentage 100%

- CB = PB = 0
- Modified AAV → no change
- Modified Funding Target → no change

“Modified Funding Shortfall”

$$0 = 587,854 - 587,890$$

Exempt – NO new S/F base

SHORTFALL AMORTIZATION

EXAMPLE #1 - 2011

ALL prior S/F bases and amortizations are eliminated because Funding Shortfall = 0

**Final Minimum required contribution =
Target Normal Cost + Funding Target minus
(AAV - CB - PB)**

$$\text{NC} = 45,220$$

$$\begin{aligned}\text{MRC} &= 45,220 + 587,854 - 587,890 \\ &= 45,183\end{aligned}$$

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SHORTFALL AMORTIZATION

EXAMPLE #1 - SUMMARY

Year	2008	2009	2010	2011
Funding target	402,000	459,888	521,764	587,854
AAV	360,000	429,923	505,372	587,890
CB	0	0	0	0
PB	0	0	0	0
AAV - CB - PB	360,000	429,923	505,372	587,890
Funding Shortfall	42,000	29,965	16,392	0
New S/F Amort base	9,840	(6,277)	0	0
New S/F installment	1,597	(1,019)	0	0
Target NC	40,200	41,808	43,480	45,220
Minimum contribution	41,797	42,387	44,059	45,183

SHORTFALL AMORTIZATION

EXAMPLE #1 - SUMMARY

Year	2012	2013	2014
Funding target	658,396	733,642	813,853
AAV	677,389	754,804	837,330
CB	0	0	0
PB	0	0	0
AAV - CB - PB	677,389	754,804	837,330
Funding Shortfall	0	0	0
New S/F Amort base	0	0	0
New S/F installment	0	0	0
Target NC	47,028	48,909	50,866
Minimum contribution	28,036	27,747	27,389

SHORTFALL AMORTIZATION EXAMPLE #2 - 2008

INITIAL VALUES

Carryover balance 0

Prefunding balance 0

AAV 360,000

Funding target 390,000

Target NC 39,000

ASSUMPTIONS

Yearly liability growth 6%

Yearly asset growth 5%

Ignore “at-risk” provisions

Shortfall amortization base exemption

Assume this plan is eligible for applicable
percentage < 100%

Summary of results on page 36

SHORTFALL AMORTIZATION

EXAMPLE #2 - 2008

Funding Shortfall

Funding Target - (AAV - CB - PB)

$$30,000 = 390,000 - (360,000 - 0 - 0)$$

EXEMPT FROM NEW S/F BASE?

Modified Assets: AAV - PB or AAV - 0
360,000

Applicable percentage 92%

Modified funding target

$$358,800 = 92\% * 390,000$$

“Modified Funding Shortfall”

$$0 = 358,800 - 360,000$$

Exempt – NO new S/F base

SHORTFALL AMORTIZATION EXAMPLE #2 - 2008

New S/F installment

$$0 = 0 / 6.1596$$

Total S/F amortization charge

0

Minimum required contribution (MRC)

Target NC + S/F amortization charge

$$39,000 = 39,000 + 0$$

Yield curve rates:

4.0% for 5 years, 5.0% for 15 years, then 6.0%

$$\begin{aligned} 6.1596 &= \ddot{a}_{\overline{5}|.04} + (\ddot{a}_{\overline{7}|.05} - \ddot{a}_{\overline{5}|.05}) \\ &= \underbrace{1 + v^1 + v^2 + v^3 + v^4}_{\text{Using 4.0\%}} + \underbrace{v^5 + v^6}_{\text{then 5.0\%}} \end{aligned}$$

SHORTFALL AMORTIZATION

EXAMPLE #2 - 2009

Assets: assume contrib. = prior year MRC
 $418,950 = 1.05 \times (360,000 + 39,000)$

Funding Target
 $454,740 = 1.06 \times (390,000 + 39,000)$

Target Normal Cost
 $41,340 = 1.06 \times (39,000)$

SHORTFALL AMORTIZATION

EXAMPLE #2 - 2009

Funding Shortfall

Funding Target - (AAV - CB - PB)

$$35,790 = 454,740 - (418,950 - 0 - 0)$$

EXEMPT FROM NEW S/F BASE?

Modified Assets: AAV - PB or AAV - 0
418,950

Applicable percentage 94%

Modified funding target

$$427,456 = 94\% * 454,740$$

“Modified Funding Shortfall”

$$8,506 = 427,456 - 418,950$$

NOT exempt – must set up new S/F base

SHORTFALL AMORTIZATION BASE WRERA

EXAMPLE #2 - 2009

Funding Shortfall Base definition

(Applicable percentage)*(Funding Target)
minus (AAV-CB-PB) minus O/S Shortfall bases

PV of prior years' S/F amortizations:

$$0 = 0 * 5.4134$$

Applicable percentage 94%

New Shortfall Base

$$8,506 = 94\% * 454,740 - (418,950 - 0 - 0) - 0$$

Yield curve rates:

4.0% for 5 years, 5.0% for 15 years, then 6.0%

$$\begin{aligned} 5.4134 &= \ddot{a}_{\overline{5}|.04} + (\ddot{a}_{\overline{6}|.05} - \ddot{a}_{\overline{5}|.05}) \\ &= \underbrace{1 + v^1 + v^2 + v^3 + v^4}_{\text{Using 4.0\%}} + \underbrace{v^5}_{\text{then 5.0\%}} \end{aligned}$$

SHORTFALL AMORTIZATION EXAMPLE #2 - 2009

New S/F installment
 $1,381 = 8,506 / 6.1596$

Total S/F amortization charge
 $1,381 = 0 + 1,381$

Minimum required contribution (MRC)
Target NC + S/F amortization charge
 $42,721 = 41,340 + 1,381$

Yield curve rates:
4.0% for 5 years, 5.0% for 15 years, then 6.0%

$$\begin{aligned} 6.1596 &= \ddot{a}_{\overline{5}|.04} + (\ddot{a}_{\overline{7}|.05} - \ddot{a}_{\overline{5}|.05}) \\ &= \underbrace{1 + v^1 + v^2 + v^3 + v^4}_{\text{Using 4.0\%}} + \underbrace{v^5 + v^6}_{\text{then 5.0\%}} \end{aligned}$$

SHORTFALL AMORTIZATION

EXAMPLE #2 - 2010

Assets: assume contrib. = prior year MRC
 $484,754 = 1.05*(418,950 + 42,721)$

Funding Target
 $525,845 = 1.06*(454,740 + 41,340)$

Target Normal Cost
 $43,820 = 1.06*(41,340)$

SHORTFALL AMORTIZATION

EXAMPLE #2 - 2010

Funding Shortfall

Funding Target - (AAV - CB - PB)

$$41,090 = 525,845 - (484,754 - 0 - 0)$$

EXEMPT FROM NEW S/F BASE?

- CB = PB = 0
- Modified AAV → no change

Applicable percentage 96%

Modified funding target

$$504,811 = 96\% * 525,845$$

“Modified Funding Shortfall”

$$20,057 = 504,811 - 484,754$$

NOT exempt – must set up new S/F base

SHORTFALL AMORTIZATION BASE WRERA

EXAMPLE #2 - 2010

Funding Shortfall Base definition

(Applicable percentage)*(Funding Target)
minus (AAV-CB-PB) minus O/S Shortfall bases

PV of prior years' S/F amortizations:

$$7,334 = 0 * 4.5460 + 1,381 * 5.3111$$

Applicable percentage 96%

New Shortfall Base

$$12,723 = 96\% * 525,845 - (484,754 - 0 - 0) - 7,334$$

Yield curve rates have changed:

5.0% for 5 years, 5.5% for 15 years, then 6.0%

$$\begin{aligned} 5.3111 &= \ddot{a}_{\overline{5}|0.05} + (\ddot{a}_{\overline{6}|0.055} - \ddot{a}_{\overline{5}|0.055}) \\ &= \underbrace{1 + v^1 + v^2 + v^3 + v^4}_{\text{Using 5.0\%}} + \underbrace{v^5}_{\text{then 5.5\%}} \end{aligned}$$

$$4.5460 = \ddot{a}_{\overline{5}|0.05}$$

SHORTFALL AMORTIZATION EXAMPLE #2 - 2010

New S/F installment

$$2,108 = 12,723 / 6.0363$$

Total S/F amortization charge

$$3,489 = 0 + 2,108 + 1,381$$

Minimum required contribution (MRC)

Target NC + S/F amortization charge

$$47,309 = 43,820 + 3,489$$

Yield curve rates have changed:

5.0% for 5 years, 5.5% for 15 years, then 6.0%

$$\begin{aligned} 6.0363 &= \ddot{a}_{\overline{5}|.05} + (\ddot{a}_{\overline{7}|.055} - \ddot{a}_{\overline{5}|.055}) \\ &= \underbrace{1 + v^1 + v^2 + v^3 + v^4}_{\text{Using 5.0\%}} + \underbrace{v^5 + v^6}_{\text{then 5.5\%}} \end{aligned}$$

Using 5.0% then 5.5%

SHORTFALL AMORTIZATION

EXAMPLE #2 - 2011

Assets: assume contrib. = prior year MRC
 $558,667 = 1.05*(484,754 + 47,309)$

Funding Target
 $603,845 = 1.06*(525,845 + 43,820)$

Target Normal Cost
 $46,450 = 1.06*(43,820)$

SHORTFALL AMORTIZATION

EXAMPLE #2 - 2011

Funding Shortfall

Funding Target - (AAV - CB - PB)

$$45,179 = 603,845 - (558,667 - 0 - 0)$$

EXEMPT FROM NEW S/F BASE?

Applicable percentage 100%

- CB = PB = 0
- Modified AAV → no change
- Modified Funding Target → no change

“Modified Funding Shortfall”

$$45,179 = 603,845 - 558,667$$

NOT exempt – must set up new S/F base

SHORTFALL AMORTIZATION BASE WRERA

EXAMPLE #2 - 2011

Funding Shortfall Base definition

(Applicable percentage)*(Funding Target)
minus (AAV-CB-PB) minus O/S Shortfall bases

PV of prior years' S/F amortizations:

$$17,471 = 0 + 1,381 * 4.5460 + 2,108 * 5.3111$$

Applicable percentage 100%

New Shortfall Base

$$27,707 = 100\% * 603,845 - (558,667 - 0 - 0) - 17,471$$

Yield curve rates:

5.0% for 5 years, 5.5% for 15 years, then 6.0%

$$\begin{aligned} 5.3111 &= \ddot{a}_{\overline{5}|.05} + (\ddot{a}_{\overline{6}|.055} - \ddot{a}_{\overline{5}|.055}) \\ &= \underbrace{1 + v^1 + v^2 + v^3 + v^4}_{\text{Using 5.0\%}} + \underbrace{v^5}_{\text{then 5.5\%}} \end{aligned}$$

$$4.5460 = \ddot{a}_{\overline{5}|.05}$$

SHORTFALL AMORTIZATION

EXAMPLE #2 - 2011

New S/F installment

$$4,590 = 27,707 / 6.0363$$

Total S/F amortization charge

$$8,079 = 0 + 4,590 + 1,381 + 2,108$$

Minimum required contribution (MRC)

Target NC + S/F amortization charge

$$54,528 = 46,450 + 8,079$$

Yield curve rates:

5.0% for 5 years, 5.5% for 15 years, then 6.0%

$$\begin{aligned} 6.0363 &= \ddot{a}_{\overline{5}|.05} + (\ddot{a}_{\overline{7}|.055} - \ddot{a}_{\overline{5}|.055}) \\ &= \underbrace{1 + v^1 + v^2 + v^3 + v^4}_{\text{Using 5.0\%}} + \underbrace{v^5 + v^6}_{\text{then 5.5\%}} \end{aligned}$$

Using 5.0% then 5.5%

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SHORTFALL AMORTIZATION

EXAMPLE #2 - SUMMARY

Year	2008	2009	2010	2011
Funding target	390,000	454,740	525,845	603,845
AAV	360,000	418,950	484,754	558,667
CB	0	0	0	0
PB	0	0	0	0
AAV - CB - PB	360,000	418,950	484,754	558,667
Funding Shortfall	30,000	35,790	41,090	45,179
New S/F Amort base	0	8,506	12,723	27,707
New S/F installment	0	1,381	2,108	4,590
Target NC	39,000	41,340	43,820	46,450
Minimum contribution	39,000	42,721	47,309	54,528

SHORTFALL AMORTIZATION EXAMPLE #2 - SUMMARY

Year	2012	2013	2014
Funding target	689,312	782,862	885,156
AAV	643,855	737,334	839,854
CB	0	0	0
PB	0	0	0
AAV - CB - PB	643,855	737,334	839,854
Funding Shortfall	45,458	45,528	45,302
New S/F Amort base	6,357	7,273	8,303
New S/F installment	1,053	1,205	1,375
Target NC	49,237	52,191	55,322
Minimum contribution	58,368	62,527	67,034

SHORTFALL AMORTIZATION

EXAMPLE #3 - 2008

INITIAL VALUES

Carryover balance 0

Prefunding balance 0

AAV 600,000

Funding target 700,000

Target NC 10,000

ASSUMPTIONS

Yearly liability growth 5%

Yearly asset growth 5%

Ignore “at-risk” provisions

Shortfall amortization base exemption

Assume this plan is eligible for applicable percentage < 100%

Summary of results on page 52

SHORTFALL AMORTIZATION

EXAMPLE #3 - 2008

Funding Shortfall

Funding Target - (AAV - CB - PB)

$$100,000 = 700,000 - (600,000 - 0 - 0)$$

EXEMPT FROM NEW S/F BASE?

Modified Assets: AAV - PB or AAV - 0
600,000

Applicable percentage 92%

Modified funding target

$$644,000 = 92\% * 700,000$$

“Modified Funding Shortfall”

$$44,000 = 644,000 - 600,000$$

NOT exempt – must set up new S/F base

SHORTFALL AMORTIZATION BASE WRERA

EXAMPLE #3 - 2008

Funding Shortfall Base definition

(Applicable percentage)*(Funding Target)
minus (AAV-CB-PB) minus O/S Shortfall bases

PV of prior years' S/F amortizations: Zero

Applicable percentage 92%

New Shortfall Base

$$44,000 = 92\% * 700,000 - (600,000 - 0 - 0) - 0$$

SHORTFALL AMORTIZATION EXAMPLE #3 - 2008

New S/F installment
 $7,242 = 44,000 / 6.0757$

Total S/F amortization charge
7,242

Minimum required contribution (MRC)
Target NC + S/F amortization charge
 $17,242 = 10,000 + 7,242$

Yield curve rates:
5.0% for 5 years, 5.0% for 15 years, then 5.0%

$6.0757 = \ddot{a}_{\overline{7}|.05}$

SHORTFALL AMORTIZATION

EXAMPLE #3 - 2009

Assets: assume contrib. = prior year MRC
 $648,104 = 1.05*(600,000 + 17,242)$

Funding Target
 $745,500 = 1.05*(700,000 + 10,000)$

Target Normal Cost
 $10,500 = 1.05*(10,000)$

SHORTFALL AMORTIZATION

EXAMPLE #3 - 2009

Funding Shortfall

Funding Target - (AAV - CB - PB)

$$97,396 = 745,500 - (648,104 - 0 - 0)$$

EXEMPT FROM NEW S/F BASE?

Modified Assets: AAV - PB or AAV - 0
648,104

Applicable percentage 94%

Modified funding target

$$700,770 = 94\% * 745,500$$

“Modified Funding Shortfall”

$$52,666 = 700,770 - 648,104$$

NOT exempt – must set up new S/F base

SHORTFALL AMORTIZATION BASE WRERA

EXAMPLE #3 - 2009

WHOA – NEW SHORTFALL BASE???

With 5% for asset and liability growth, plus 5% for all three segment rates, the new shortfall base should be ZERO each year

SHORTFALL AMORTIZATION BASE WRERA

EXAMPLE #3 - 2009

The 2009 Shortfall base was ZERO prior to the WRERA changes:

2008 Shortfall base	100,000
2008 Shortfall charge	16,459
2008 MRC	26,459
2009 AAV	657,782
2009 Funding Shortfall	87,718
2009 O/S Shortfall base	87,718
2009 new shortfall base	ZERO

As a result of WRERA changes, example #3 shows unexpected result:

When all assumptions are met each year, plan must establish a new shortfall base!

SHORTFALL AMORTIZATION BASE WRERA

EXAMPLE #3 - 2009

Funding Shortfall Base definition

(Applicable percentage)*(Funding Target)
minus (AAV-CB-PB) minus O/S Shortfall bases

PV of prior years' S/F amortizations:

$$38,596 = 7,242 * 5.3295$$

Applicable percentage 94%

New Shortfall Base

$$14,070 = 94\% * 745,500 - (648,104 - 0 - 0) - 38,596$$

Yield curve rates:

5.0% for 5 years, 5.0% for 15 years, then 5.0%

$$5.3295 = \ddot{a}_{\overline{6}|0.05}$$

SHORTFALL AMORTIZATION EXAMPLE #3 - 2009

New S/F installment

$$2,316 = 14,070 / 6.0757$$

Total S/F amortization charge

$$9,558 = 7,242 + 2,316$$

Minimum required contribution (MRC)

Target NC + S/F amortization charge

$$20,058 = 10,500 + 9,558$$

Yield curve rates:

5.0% for 5 years, 5.0% for 15 years, then 5.0%

$$6.0757 = \ddot{a}_{\overline{7}|.05}$$

SHORTFALL AMORTIZATION

EXAMPLE #3 - 2010

Assets: assume contrib. = prior year MRC

$$701,570 = 1.05*(648,104 + 20,058)$$

Funding Target

$$793,800 = 1.05*(745,500 + 10,500)$$

Target Normal Cost

$$11,025 = 1.05*(10,500)$$

SHORTFALL AMORTIZATION

EXAMPLE #3 - 2010

Funding Shortfall

Funding Target - (AAV - CB - PB)

$$92,230 = 793,800 - (701,570 - 0 - 0)$$

EXEMPT FROM NEW S/F BASE?

- CB = PB = 0
- Modified AAV → no change

Applicable percentage 96%

Modified funding target

$$762,048 = 96\% * 793,800$$

“Modified Funding Shortfall”

$$60,478 = 762,048 - 701,570$$

NOT exempt – must set up new S/F base

SHORTFALL AMORTIZATION BASE WRERA

EXAMPLE #3 - 2010

Funding Shortfall Base definition

(Applicable percentage)*(Funding Target)
minus (AAV-CB-PB) minus O/S Shortfall bases

PV of prior years' S/F amortizations:

$$45,264 = 7,242 * 4.5460 + 2,316 * 5.3295$$

Applicable percentage 96%

New Shortfall Base

$$15,215 = 96\% * 793,800 - (701,570 - 0 - 0) - 45,264$$

Yield curve rates:

5.0% for 5 years, 5.0% for 15 years, then 5.0%

$$5.3295 = \ddot{a}_{\overline{6}|0.05}$$

$$4.5460 = \ddot{a}_{\overline{5}|0.05}$$

SHORTFALL AMORTIZATION EXAMPLE #3 - 2010

New S/F installment

$$2,504 = 15,215 / 6.0757$$

Total S/F amortization charge

$$12,062 = 7,242 + 2,504 + 2,316$$

Minimum required contribution (MRC)

Target NC + S/F amortization charge

$$23,087 = 11,025 + 12,062$$

Yield curve rates:

$$6.0757 = \ddot{a}_{7|0.05}$$

SHORTFALL AMORTIZATION

EXAMPLE #3 - SUMMARY

Year	2008	2009	2010	2011
Funding target	700,000	745,500	793,800	845,066
AAV	600,000	648,104	701,570	760,890
CB	0	0	0	0
PB	0	0	0	0
AAV - CB - PB	600,000	648,104	701,570	760,890
Funding Shortfall	100,000	97,396	92,230	84,177
New S/F Amort base	44,000	14,070	15,215	33,340
New S/F installment	7,242	2,316	2,504	5,487
Target NC	10,000	10,500	11,025	11,576
Minimum contribution	17,242	20,058	23,087	29,126

SHORTFALL AMORTIZATION **EXAMPLE #3 - SUMMARY** ---

Year	2012	2013	2014
Funding target	899,475	957,211	1,018,473
AAV	829,516	902,181	979,118
CB	0	0	0
PB	0	0	0
AAV - CB - PB	829,516	902,181	979,118
Funding Shortfall	69,959	55,030	39,355
New S/F Amort base	0	0	0
New S/F installment	0	0	0
Target NC	12,155	12,763	13,401
Minimum contribution	29,704	30,312	30,950

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