

# SECTION 430(g) Asset Valuation

# SECTION 430(h) Yield Curve

## **§430**

### **MINIMUM FUNDING**

### **SINGLE EMPLOYER DB PLANS**

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- (a) Minimum required contribution**
- (b) Target normal cost**
- (c) Shortfall amortization charge**
- (d) Rules relating to funding target**
- (e) Waiver amortization charge**
- (f) Reduction of minimum required contribution by credit balances**
- (g) Valuation of plan assets and liabilities**
- (h) Actuarial assumptions and methods**
- (i) Special rules for at-risk plans**
- (j) Payment of minimum contributions**
- (k) Imposition of lien - failure to make required contributions**
- (l) Qualified transfers (IRC §420)**

## **2015 GENERAL CONDITIONS – FUNDING**

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- 17. Assumed retirement age is NRA by default**
- 18. No pre-retirement decrements by default**
- 19. Assumptions = reasonable / best estimate**
- 20-26. Discuss later in IRC 431**
- 27-32. Discuss later in IRC 430**
- 33. No past changes in cost method, asset valuation method, or assumptions, except as required under PPA 2006**

## **2015 GENERAL CONDITIONS – FUNDING**

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**34-36. Discuss later in IRC 430**

**37-38. Discuss later in IRC 431**

**39-40. Discuss later in IRC 404**

**41-42. Discuss later in IRC 430**

**43-44. Discuss later in IRC 431**

**45-46. Discuss later in IRC 430(i)**

**47. Discuss later in IRC 430(j)**

**MINIMUM / MAXIMUM FUNDING PROBLEMS (for EA-2F) BY TYPE**

Problem Type	2016 Exam	2015 Exam	2014 Exam	2013 Exam
<b>SINGLE EMPLOYER – MAXIMUM</b>				
Deductible limit / excise tax	17, 48, 50	08, 25, 36	30, 44	33, 43
<b>SINGLE EMPLOYER – MINIMUM</b>				
“Smallest amount” to satisfy MFSA	04, 36			06, 20
“Minimum contribution” for MFSA	05, 28, 30	46		13, 36, 55
Shortfall base / charge / amort at 01/01	25		26	46
Carryover / prefunding balance – next yr	37	10, 30, 51, 56	02, 05, 11, 53	41
Calculate funding target, target NC	01, 03, 18, 23, 38, 42	01, 11, 13	01, 08, 10, 13, 32, 35, 46, 54, 55	03, 04, 09, 11, 26, 28
AAV calculation	12, 24, 46	09, 16	16, 22	22
Quarterly / liquidity contributions	19, 22, 29, 40, 44	02, 18, 24, 44, 53	21, 33, 49	12, 27, 48, 49
Waivers	13	17, 34, 49	31, 34	23, 37
Cash balance plans	11	41, 55	17, 45	15, 18
401(a)(17) details		54		
Miscellaneous definitions	31, 35	19, 21, 23, 40, 42, 45, 57	09, 15, 19, 23, 24, 25, 36, 42	02, 05, 07, 08, 47, 53
IRC 436	51		40, 41	14, 32
At-Risk Funding target		31	18	
At-Risk definitions	08	32		

Problem Type	2016 Exam	2015 Exam	2014 Exam	2013 Exam
<b>MULTIEMPLOYER – MAXIMUM</b>				
Deductible limit / excise tax	16			17
<b>MULTIEMPLOYER – MINIMUM</b>				
AAV method / calculations	09, 33	12, 48	29, 37	31, 39
MFSA - other	10, 14, 26	06, 27	47	
MFSA amortization payment	47	04, 38, 47	50, 52	24, 38, 42
Actuarial balance equation		14, 20, 35		
Plan change	32	05	04	44
Full Funding Limitation	06	15		
Critical / endangered status	02	50	38	16, 21, 25, 35, 50
Miscellaneous definitions		43, 52	06, 07, 27	01

Problem Type	2016 Exam	2015 Exam	2014 Exam	2013 Exam
IRC 414				
IRC 415	39	33	51	40, 52
IRC 416				
IRC 417(e)	27			10

**MINIMUM / MAXIMUM FUNDING PROBLEMS (for EA-2F) BY TYPE**

<b>DEDUCTIBLE LIMITS</b>									
<b>Problem Type</b>	<b>2007 Exam</b>	<b>2006 Exam</b>	<b>2005 Exam</b>	<b>2004 Exam</b>	<b>2003 Exam</b>	<b>2002 Exam</b>	<b>2001 Exam</b>	<b>2000 Exam</b>	<b>1999 Exam</b>
<b>FFL calcs</b>		27	44	20	45	01, 02 26, 30 31	41	46	28, 45
<b>404(a)(7) DB/DC</b>		16			21		39	36, 48	39
<b>404 and/or MFSA</b>		32	10, 22 27, 41	19, 21 36	19, 30 40	37	04, 42		
<b>Tax year</b>		08	35	44	18, 33	28		39	29, 30
<b>Interest change</b>					43				40
<b>RR 81-213 (max)</b>				24					31
<b>Miscellany</b>		39		32			19		

<b>MINIMUM CONTRIBUTIONS</b>									
<b>Method change</b>		03, 10, 30	01, 06, 07, 29, 33, 34, 36	01, 29 30, 31 42	03, 37	10, 16 21	06, 08 15, 28 38, 43	35	32, 43
<b>CL, FFL</b>		02, 05, 15, 34	05, 19, 25	07	20, 25	33	12, 40	03, 04	
<b>Balance equation</b>		04, 07, 23, 36	16, 39, 40	09, 18, 26	07, 23 31	03, 05 39	02, 35		
<b>Plan change</b>			46		13, 15 38, 41		13	34	21
<b>Miscellany</b>		12, 18	02, 09, 15	38, 41	01	11, 12 13	24	05, 06 08, 32	
<b>Waiver</b>		09	38	39, 43	10	19	20	26	
<b>Interest change</b>		29, 37	04, 08, 18	08, 10	05, 28	24	21, 34 36	41	24
<b>RR 81-213 (min)</b>					22	25		17	
<b>Multiemployer</b>		21	37				29	49	22
<b>Earned income</b>									50
<b>Quarterly / Liquidity</b>		26, 38, 41	26, 30	03, 15, 25	09, 26, 32	17, 29	03, 26, 27	11, 43	44, 46
<b>N/A or obsolete</b>		14, 20, 22, 24	12, 13, 20, 43	02, 16 17, 23, 37, 40	16, 35 39	04, 08	05, 10, 14, 17, 30, 33	28, 29, 30, 33, 38, 40	12, 23, 35, 37, 41, 49

<b>IRC 414 / 415 / 416 PROBLEMS (from EA-2B exams) BY TYPE</b>									
<b>Problem Type</b>	<b>2007 Exam</b>	<b>2006 Exam</b>	<b>2005 Exam</b>	<b>2004 Exam</b>	<b>2003 Exam</b>	<b>2002 Exam</b>	<b>2001 Exam</b>	<b>2000 Exam</b>	<b>1999 Exam</b>
<b>414(l)</b>	10, 23		07	05, 18				10	
<b>415</b>	11, 14, 25, 29, 37	01, 09, 12, 18, 23, 28, 35	03, 04, 18, 24, 33, 36	22, 25, 37	04, 05 24, 25 26, 27	10, 15, 16, 29	01, 07, 35	13, 16, 22, 24	27, 50
<b>416</b>	09	11, 34	05, 06, 25, 40	26, 38	06, 07 28, 29	04, 17, 28	36	14, 18, 21	11, 15, 42

# SUMMARY OF RECENT PROBLEMS NUMBER AND POINT VALUES

		Number of problems				Number of points			
Year		2016	2015	2014	2013	2016	2015	2014	2013
Multiemployer		10	15	10	13	30	45	28	36
414-415-416-417		2	1	1	3	7	4	3	8
Cost methods		<u>9</u>	<u>8</u>	<u>8</u>	<u>8</u>	<u>33</u>	<u>28</u>	<u>32</u>	<u>27</u>
Sub-total		21	24	19	24	70	77	63	71
Single employer		30	33	36	32	90	83	97	89
All total		51	57	55	56	160	160	160	160

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## **§430(g)(2)**

### **VALUATION OF ASSETS AND LIABILITIES**

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#### **VALUATION DATE**

**Must be first day of the plan year**

#### **SMALL PLAN EXCEPTION**

**If 100 or less participants on each day of prior plan year, can use valuation date on any day during the plan year**

**Participant count uses plan aggregation**

- ) Aggregate all plans**
- ) Include all non-multiemployer DB plans in controlled group**
- ) Only count participants of employer**

## **§430(h)(2)**

### **INTEREST RATES**

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#### **Segment Rate**

- ) Single rate of interest**
- ) Based on corporate bond yield curve**
- ) Based on bonds maturing during specified period of 5 years, 15 years, or remaining**
- ) Based on “Applicable month”**

## **§430(h)(2)**

### **INTEREST RATES**

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#### **Applicable month**

- ) Default – month which contains valuation date**
- ) Can elect to use any of 4 preceding months**
  - Applies to current and future plan years**
  - Revoke election - need Secretary consent**

**Applicable month is similar to look back month under §417. Can have different value under §430 than under §417.**

## **§430(h)(2)**

### **SEGMENT INTEREST RATES versus EFFECTIVE INTEREST RATE**

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**Funding Target - similar to  
Unit Credit accrued liability = PV of AB**

**Interest rates for Funding Target:**

**For benefits payable**

**) First 5 years**

**) Next 15 years**

**) After 20 years**

**Use segment rate**

**First 5 years**

**Next 15 years**

**After 20 years**

**Effective interest rate**

**Single interest rate that reproduces the  
Funding Target (non-At-Risk)**

## **§430(g)(3)**

### **ACTUARIAL ASSET VALUE (AAV)**

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**) Default value = Fair market value (MVA)**

**) Can use formula for AAV**

**) 90% MVA    final AAV    110% MVA**

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## **§430(g)(4)**

### **VALUATION OF ASSETS**

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#### **Handling of contributions**

##### **) **Prior plan year** contributions**

- **Made after valuation date**
- **Include present value in assets**
- **Present value based on “Effective rate of interest” for **prior plan year****

#### **NOTE**

**Effective for plan years starting AFTER 2008**

## **§430(g)(4)**

### **VALUATION OF ASSETS**

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#### **Handling of contributions**

##### **) Current plan year contributions**

- **Made prior to valuation date**
- **Exclude from actuarial asset value**
- **Exclude interest based on “Effective rate of interest” for current plan year**

**Example – end of year valuation date**



## **§430(h)(2)**

### **INTEREST RATES**

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#### **Corporate bond yield curve**

- ) Average for prior 24 months**
- ) Monthly yields**
- ) Investment grade corporate bonds**
- ) Top 3 quality levels**

## **§430(h)(2)(F) YIELD CURVE**

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**Data is published monthly by IRS via Notices:**

- ) 430(h)(2)(D) yield curve**
- ) 430(h)(2)(C) segment rates**
- ) 417(e)(3)(D)(i) modified yield curve**

**PRACTICAL NOTE - NOT ON SYLLABUS:  
Some hints on methodology used are in  
IRS Notice 2007-81**

**Technical details are in this write-up:  
[http://www.ustreas.gov/offices/economic-policy/reports/corporate\\_yield\\_curve\\_2007.pdf](http://www.ustreas.gov/offices/economic-policy/reports/corporate_yield_curve_2007.pdf)**

**SEGMENT RATE STABILIZATION**

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**Starting in 2012, segment rates are limited by a corridor based on annual average segment rates for prior 25 years**

<b>Calendar <u>year</u></b>	<b>Applicable minimum <u>percentage</u></b>	<b>Applicable maximum <u>percentage</u></b>
<b>2012-2020</b>	<b>90%</b>	<b>110%</b>
<b>2021</b>	<b>85%</b>	<b>115%</b>
<b>2022</b>	<b>80%</b>	<b>120%</b>
<b>2023</b>	<b>75%</b>	<b>125%</b>
<b>After 2023</b>	<b>70%</b>	<b>130%</b>

**NOTE - Language in (C)(iv)(I) requires use of applicable minimum / maximum value, whichever is closest to value of segment rate**

# §430(h)(2)(F) YIELD CURVE

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## Sample reporting - Yield Curve

### April 2013 - IRS Notice 2013-32

**Table I**

Monthly Yield Curve for April 2013  
Derived from April 2013 Data

<i>Maturity</i>	<i>Yield</i>	<i>Maturity</i>	<i>Yield</i>	<i>Maturity</i>	<i>Yield</i>	<i>Maturity</i>	<i>Yield</i>	<i>Maturity</i>	<i>Yield</i>
0.5	0.27	20.5	4.55	40.5	4.93	60.5	5.06	80.5	5.13
1.0	0.46	21.0	4.57	41.0	4.93	61.0	5.06	81.0	5.13
1.5	0.62	21.5	4.58	41.5	4.93	61.5	5.07	81.5	5.13
2.0	0.77	22.0	4.60	42.0	4.94	62.0	5.07	82.0	5.13
2.5	0.89	22.5	4.61	42.5	4.94	62.5	5.07	82.5	5.13
3.0	1.00	23.0	4.63	43.0	4.95	63.0	5.07	83.0	5.14
3.5	1.12	23.5	4.64	43.5	4.95	63.5	5.07	83.5	5.14
4.0	1.24	24.0	4.65	44.0	4.96	64.0	5.08	84.0	5.14
4.5	1.38	24.5	4.66	44.5	4.96	64.5	5.08	84.5	5.14
5.0	1.54	25.0	4.68	45.0	4.97	65.0	5.08	85.0	5.14
5.5	1.71	25.5	4.69	45.5	4.97	65.5	5.08	85.5	5.14
6.0	1.89	26.0	4.70	46.0	4.97	66.0	5.08	86.0	5.14
6.5	2.08	26.5	4.71	46.5	4.98	66.5	5.09	86.5	5.14
7.0	2.27	27.0	4.72	47.0	4.98	67.0	5.09	87.0	5.14
7.5	2.46	27.5	4.73	47.5	4.99	67.5	5.09	87.5	5.15
8.0	2.64	28.0	4.74	48.0	4.99	68.0	5.09	88.0	5.15
8.5	2.82	28.5	4.75	48.5	4.99	68.5	5.09	88.5	5.15
9.0	2.99	29.0	4.76	49.0	5.00	69.0	5.09	89.0	5.15
9.5	3.15	29.5	4.77	49.5	5.00	69.5	5.10	89.5	5.15
10.0	3.30	30.0	4.78	50.0	5.00	70.0	5.10	90.0	5.15

# §430(h)(2)(F) YIELD CURVE

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## Sample reporting - Segment rates

### April 2013 - IRS Notice 2013-32

Notice 2007-81, 2007-44 I.R.B. 899, provides guidelines for determining the monthly corporate bond yield curve, and the 24-month average corporate bond segment rates used to compute the target normal cost and the funding target. Pursuant to Notice 2007-81, the monthly corporate bond yield curve derived from April 2013 data is in Table I at the end of this notice. The spot first, second, and third segment rates for the month of April 2013 are, respectively, 0.93, 3.61, and 4.88. For plan years beginning in on or after January 1, 2012, the 24-month average segment rates determined under § 430(h)(2)(C)(iv) must be adjusted by the applicable percentage of the corresponding 25-year average segment rates. The 25-year average segment rates for plan years beginning in 2012 and for plan years beginning in 2013 were published in Notices 2012-55 and 2013-11, respectively. The three 24-month average corporate bond segment rates applicable for March 2013 without adjustment, and the adjusted 24-month average segment rates taking into account the applicable percentages of the corresponding 25-year average segment rates, are as follows:

For Plan Years Beginning In	Applicable Month	24-Month Average Segment Rates Not Adjusted			Adjusted 24-Month Average Segment Rates, Based on Applicable Percentage of 25-Year Average Rates		
		First Segment	Second Segment	Third Segment	First Segment	Second Segment	Third Segment
2012	May 2013	1.46	4.15	5.20	5.54	6.85	7.52
2013	May 2013	1.46	4.15	5.20	4.94	6.15	6.76

## **§430(h)(2)(D)(ii)**

### **ELECTION TO USE FULL YIELD CURVE**

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- ) Rates vary year by year - no segment rates**
- ) No averaging for prior 24 months**
- ) Full yield curve does not reflect MAP-21 segment rate stabilization**
- ) Revoke election - need Secretary consent**

### **PRACTICAL NOTES:**

Code says you can only use full yield curve for minimum required contribution - not quite correct. Informally, IRS says you can do this for 404(o) maximum - assumptions and methods are the same as under 430.

MAP-21 relief - you can revoke election without consent. Plan sponsor can elect not to use full yield curve. Notice must be given to plan EA by 07/05/2013, include first plan year for which segment rates will be used, and specify applicable lookback month.

## **§430(g)(3)(B)**

### **ACTUARIAL ASSET VALUE (AAV)**

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#### **Averaging of Fair market values**

- ) Latest value: MVA at valuation date**
- ) Earliest value: MVA on last day of 25<sup>th</sup> month prior to month of valuation date**
- ) Must adjust for contributions, distributions and expected earnings**

## **1.430(g)-1(c)(2)(iii)(A)**

### **DETERMINATION DATES**

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- ) The period of time between each determination date must be equal**
- ) Treat valuation date as a determination date**
- ) Period of time cannot exceed 12 months**
- ) Earliest determination date cannot be earlier than the last day of the 25<sup>th</sup> month before the valuation date**
- ) Can use more frequent determination dates - for example, monthly or quarterly**



# §1.412(c)(2)-1 REGULATION ACTUARIAL ASSET VALUE - HISTORY

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Define cash flow as contributions - benefit payments - expenses + interest + dividends

Adjust market values for earlier years to current date by adding in cash flows for intervening years:

Market Values	$\frac{MVA_{t-2}}{cash_{t-0}}$	$\frac{MVA_{t-1}}{cash_{t-0}}$	$\frac{MVA_t}{cash_{t-0}}$
Cash flows			
Cash flows	$cash_{t-1}$		
Cash flows			
Cash flows			
Add columns	$\phi = X_{t-2}$	$\phi = X_{t-1}$	$\phi = X_t$

Average market value of assets (three years):

$$AMV = \frac{\sum_{j=0}^{t-2} X_{t-j}}{3}$$

Final AAV must be within 90% / 110% corridor

# **REVENUE PROCEDURE 2000-40**

## **ACTUARIAL ASSET VALUE - HISTORY**

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### **METHOD 15**

**Smoothed market value without phase-in**

**Calculate expected MVA from last year MVA using valuation rate for expected interest on cash flows (excluding expenses).**

**Determine G/L each year based on the expected value of assets versus the market value.**

**Assume three year averaging period:**

**01/2012 AAV =**

**01/2012 MVA -  $\frac{2}{3}(G/L_{2011}) - \frac{1}{3}(G/L_{2010})$**

**Identical result as approach in §1.412(c)(2)-1**

## **§430(g)(3)(B)**

### **ACTUARY'S ASSUMED RATE OF RETURN**

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**WRERA (12/2008) modified 430(g)(3) to include adjustment for expected earnings.**

**Now have new actuarial assumption – actuary's assumed rate of return. This is only used to determine the value of plan assets.**

**Prior historical AAV methods defined cash flows without adjustment for expected earnings.**

**§430(g)(3)(B)**

**ACTUARY'S ASSUMED RATE OF RETURN**

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**LIMITATION**

**Assumption for expected earnings can not exceed the third segment rate used for the valuation**

## **NOTICE 2009-22**

### **ACTUARY'S ASSUMED RATE OF RETURN**

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#### **ALTERNATE LIMITATION**

**If the valuation is based on the full yield curve, then the segment rates are not used for the valuation.**

**In that case, the assumption for expected earnings can not exceed the average of the third segment rates for the 24-month period ending with the month preceding the month that contains the valuation date for the plan year.**

# **NOTICE 2009-22**

## **EXAMPLE 1**

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### **AAV based on three year average**

<b>Year</b>	<b>2007</b>	<b>2008</b>	<b>2009</b>
<b>MVA at 1-1</b>	<b>135,500</b>	<b>176,000</b>	<b>162,000</b>
<b>LY contrib pd 09/15</b>	<b>61,000</b>	<b>62,000</b>	<b>68,781</b>
<b>LY EIR</b>			<b>6.0%</b>
<b>PV of LY contrib</b>	<b>61,000</b>	<b>62,000</b>	<b>66,000</b>
<b>MVA at 1-1 INCL</b>			
<b>PV of LY contrib</b>	<b>196,500</b>	<b>238,000</b>	<b>228,000</b>

**01/2009 market value includes PV of 2008  
plan year contribution at 2008 EIR of 6.0%**

# **NOTICE 2009-22**

## **EXAMPLE 1**

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### **Market value reconciliation**

<b>Year</b>	<b>2007</b>	<b>2008</b>
<b>Market value at 1-1</b>	<b>196,500</b>	<b>238,000</b>
<b>PV of LY contrib</b>	<b>62,000</b>	<b>66,000</b>
<b>Benefit payments</b>	<b>-24,000</b>	<b>-25,000</b>
<b>Expenses</b>	<b>-7,000</b>	<b>-7,500</b>
<b>Interest and Dividends</b>	<b><u>7,500</u></b>	<b><u>7,000</u></b>
<b>Cash flows during year</b>	<b>38,500</b>	<b>40,500</b>
<b>Net realized gains (losses)</b>	<b>6,000</b>	<b>-8,500</b>
<b>Balancing item</b>	<b>-3,000</b>	<b>-42,000</b>
<b>Market value at 12-31</b>	<b>238,000</b>	<b>228,000</b>

**Balancing item is unrealized gain (loss) – not actually used in AAV calculation**

# **NOTICE 2009-22**

## **EXAMPLE 1**

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### **Assumed rate of return**

	<b>2007</b>	<b>2008</b>
<b>Estimated return for year</b>	<b>6.25%</b>	<b>6.25%</b>
<b>Segment rate limitation</b>	<b>3rd spot 12/2006 6.09%</b>	<b>3rd seg 09/2007 6.38%</b>
<b>Estimated return - limited</b>	<b>6.09%</b>	<b>6.25%</b>

### **Expected return calculation**

	<b>2007</b>	<b>2008</b>
<b>Beginning of year values</b>		
<b>Market value at 1-1</b>	<b>196,500</b>	<b>238,000</b>
<b>Middle of year values</b>		
<b>Benefit payments + expenses</b>	<b>-31,000</b>	<b>-32,500</b>
<b>Expected return (compound)</b>	<b>11,037</b>	<b>13,875</b>



# **NOTICE 2009-22**

## **EXAMPLE 1**

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### **Average market value calculation**

<b>Year</b>	<b>2007</b>	<b>2008</b>	<b>2009</b>
<b>Trust assets at 1-1</b>	<b>135,500</b>	<b>176,000</b>	<b>162,000</b>
<b>Market value at 1-1</b>	<b>196,500</b>	<b>238,000</b>	<b>228,000</b>

<b>PV of LY contrib</b>	<b>62,000</b>	<b>66,000</b>	
<b>Benefit payments</b>	<b>-24,000</b>	<b>-25,000</b>	
<b>Expenses</b>	<b>-7,000</b>	<b>-7,500</b>	
<b>Expected return</b>	<b><u>11,037</u></b>	<b><u>13,875</u></b>	
<b>Adjustment for year</b>	<b>42,037</b>	<b>47,375</b>	

<b>Year</b>	<b>2007</b>	<b>2008</b>	<b>2009</b>
<b>Market value at 1-1</b>	<b>196,500</b>	<b>238,000</b>	<b>228,000</b>
<b>Adjustment for 2007</b>	<b>42,037</b>		
<b>Adjustment for 2008</b>	<b><u>47,375</u></b>	<b><u>47,375</u></b>	
<b>Adjusted MVA</b>	<b>285,912</b>	<b>285,375</b>	<b>228,000</b>

**On exam problems, you must calculate  
“adjustment for year”**

# **NOTICE 2009-22**

## **EXAMPLE 1**

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**3 year average market value**

$$266,429 = (285,912 + 285,375 + 228,000) / 3$$

**Corridor values**

$$90\% * (228,000) = 205,200$$

$$110\% * (228,000) = 250,800$$

**Final AAV - Limited by corridor**

**250,800**