



AMERICAN ACADEMY *of* ACTUARIES

MEMORANDUM

To: NAIC Life and Health Actuarial Task Force
From: Work Group of the Academy's Life Financial Soundness/Risk Management Committee
Subject: Draft Revisions to Actuarial Guideline 34
Date: 10/30/03

The following draft guideline includes proposed revisions (redlined) based on the 9/12/03 NAIC version of Actuarial Guideline XXXIV: Variable Annuity Minimum Guaranteed Death Benefit Reserves.

**ACTUARIAL GUIDELINE XXXIV
VARIABLE ANNUITY MINIMUM GUARANTEED
DEATH BENEFIT RESERVES**

I. Background

The purpose of this Actuarial Guideline is to interpret the standards for the valuation of reserves for Minimum Guaranteed Death Benefits (MGDBs) included in variable annuity contracts. This Guideline codifies the basic interpretation of the Commissioners Annuity Reserve Valuation Method (CARVM) by clarifying the assumptions and methodologies which will comply with the intent of the Standard Valuation Law (SVL).

For many years the industry has struggled with the issue of applying a uniform reserve standard to variable annuities in general, and to MGDBs in particular. Three regulatory sources are often looked to for guidance. First, the SVL requires that CARVM be based on the greatest present value of future guaranteed benefits. Second, Actuarial Guideline XXXIII requires that “each benefit stream available under the contract must be individually valued and the ultimate reserve established must be the greatest of the present values of these values.” Third, the NAIC model Variable Annuity Regulation (VAR) states that the “reserve liability for variable annuities shall be established pursuant to the requirements of the Standard Valuation Law in accordance with actuarial procedures that recognize the variable nature of the benefits provided and any mortality guarantees.”

This Guideline interprets the standards for applying CARVM to MGDBs in variable annuity contracts, employing methods that recognize the variable nature of the benefits. It clarifies standards for developing integrated benefit streams, where MGDBs are integrated with other benefits such as surrenders and annuitizations. It also clarifies standards for determining the level of reserve to be held in the General Account.

This Guideline requires that MGDBs be projected by assuming an immediate drop in the values of the assets supporting the variable annuity contract, followed by a subsequent recovery at a net assumed return until the maturity of the contract. The projection should reflect the contractual definition of the MGDB and any contractual limitations, such as provisions that terminate the MGDB at a given age and those that restrict the MGDB to a given multiple of contract contributions. The immediate drops and assumed returns used in the projection vary by five asset classes in order to reflect the risk/return differentials inherent in each class.

This Guideline also interprets the mortality standards to be applied to projected MGDBs in the reserve calculation. As part of the study of mortality experience under variable annuities during the deferral period, the Society of Actuaries’ Task Force on Mortality Guarantees in Variable Products will be validating the appropriateness of this mortality standard and, if necessary, recommend an alternative course of action.

In addition, this Guideline clarifies standards for reserve methods for reinsurance transactions involving MGDBs. Unlike the annuity writer, the reinsurer may not be able to integrate the MGDB with other base contract benefits, since the reinsurer does not normally reinsure any aspects of the variable annuity other than the death benefit. The reinsurer and the direct writer do face identical fund performance risks, so it is appropriate that the reinsurer’s reserve method incorporate the same immediate drops and recoveries as the direct writer. Similarly, the reinsurer’s reserve method should include a future projection of MGDB levels, to appropriately assess future death benefit obligations. Furthermore, just as the direct writer’s reserve calculation should recognize the underlying asset charges, the reinsurer’s reserve calculation should recognize reinsurance premiums.

Finally, there are some companies that have not applied CARVM in calculating variable annuity reserves. For example, some companies have held a reserve equal to the account value. Such companies may be able to demonstrate that their reserves meet or exceed the levels set by applying this Guideline, and that no additional MGDB reserves are required. Alternatively, other companies which have held a reserve equal to the cash surrender value may need to hold an additional MGDB reserve such that their total reserve is at least equal to the levels set by applying this Guideline. In these situations, the company must determine an appropriate allocation of the total reported reserve between the General and Separate Accounts.

II. Scope

This Guideline applies to variable annuity contracts which provide a Minimum Guaranteed Death Benefit that has the potential to exceed the account value, whether or not the MGDB exceeds the account value on the valuation date. This Guideline does not apply to group variable annuity contracts which are not subject to CARVM. Currently offered MGDBs falling under the scope of this guideline include, but are not limited to, provisions commonly referred to as Return of Premium, Roll-ups, Ratchets and Resets. However, the actuary should also exercise judgment in determining the applicability of this Guideline. For example, it may be inappropriate to utilize this Guideline for a contract with an MGDB where the associated net amount at risk (NAR) decreases when the underlying funds experience a drop in market value or a period of underperformance.

~~While the method described in this Actuarial Guideline does not reflect future partial withdrawal activity, the appointed actuary must perform a standalone asset adequacy analysis of the variable annuity contract risks. Such analysis shall be performed reflecting all benefits and guarantees in the contract associated with the variable annuity contract, as well as all expenses and asset-based charges associated with the variable annuity contract. The analysis shall be performed consistent with the requirements of Section 6 of the NAIC Model AOMR, including the requirement that the analysis conform to the Actuarial Standards of Practice as promulgated from time to time by the Actuarial Standards Board.~~

III. Definitions

“Reduced Account Value”: The account value on the valuation date, reduced by the sum of the immediate drops for each asset class, as defined in Section IV.D.

“Projected Reduced Account Value”: The Reduced Account Value, projected into the future using the Net Assumed Returns for each asset class, as defined in Section IV.D. The determination of the Projected Reduced Account Value should not reflect future partial withdrawals.

“Projected Net Amount at Risk”: The projected death benefit resulting from the MGDB and the Projected Reduced Account Value, less the Projected Reduced Account Value.

“Projected Unreduced Account Value”: The projected account value, without reduction for an immediate drop, projected using a return based on the valuation rate less appropriate asset based charges.

“Base Benefit Streams”: The streams of projected benefits reflecting the Projected Unreduced Account Values and ignoring MGDBs.

“Integrated Benefit Stream”: Streams which reflect the Base Benefit Streams discounted for survivorship and the MGDBs discounted for mortality.

“Calculation Period”: The periods for which the Integrated Benefit Streams are projected in the Integrated Reserve calculation, consisting of successive periods, beginning with the remainder of the contract year following the valuation date and ending with the period from the valuation date to the maturity date of the contract.

IV. Text

A. General Methodology

The valuation of reserves for MGDBs involves two CARVM reserve calculations: a Separate Account Reserve and an Integrated Reserve. The Integrated Reserve represents the total reserve held by the company in support of the entire variable annuity contract. The additional reserve held for the MGDB, which equals the excess of the Integrated Reserve over the Separate Account Reserve, but not less than zero, is held in the General Account.

B. Separate Account Reserve Calculation

The Separate Account Reserve represents the reserve that would be held in the absence of the MGDB.

C. Integrated Reserve Calculation

The Integrated Reserve is a CARVM reserve determined using all contract benefits, including the MGDB. It equals the greatest present value, as specified in the SVL and the VAR, of future Integrated Benefit Streams available under the terms of the contract.

The integration of the MGDB with other contract benefits in the determination of future Integrated Benefit Streams is accomplished by combining three separate benefit streams A, B and C described below. These future Integrated Benefit Streams are determined over all Calculation Periods, and are discounted at the valuation interest rate (discussed further in Section IV.E.).

- A is the stream of Projected Net Amounts at Risk paid to those expected to die during the Calculation Period, based on valuation mortality (discussed further in Section IV.E.).
- B is the benefit stream of Projected Unreduced Account Values paid to those expected to die during the Calculation Period, based on valuation mortality.
- C is the Base Benefit Streams provided during the Calculation Period, and is discounted for survivorship based on valuation mortality.

The greatest present value occurs in the Calculation Period in which the present value of the future Integrated Benefit Streams is maximized (as opposed to the present values of A, B and C being individually maximized).

[The Integrated Reserve is also subject to the asset adequacy analysis requirement in subsection G.](#)

D. Immediate Drops and Assumed Returns

The Projected Net Amount at Risk described in Section IV.C. is determined by assuming an immediate drop in the supporting asset values, followed by a subsequent recovery based upon a net assumed return.

For example, the Reduced Account Value after the immediate drop would equal the account value on the valuation date, multiplied by $(1 - \text{Immediate Drop Percentage})$. The Projected Reduced Account Value “n” years later would equal the Reduced Account Value multiplied by $(1 + \text{Net Assumed Return})^n$. The projection should continue until the maturity of the contract.

To determine the immediate drop and net assumed return, the Separate Account funds supporting the variable annuity contracts on the valuation date should be allocated to the five asset classes as follows:

- Equity Class
- Bond Class
- Balanced Class
- Money Market Class
- Specialty Class

Descriptions of these classes are contained in Appendix III. Since these descriptions are broad in nature, the ultimate determination of the appropriate fund classifications, for purposes of this Guideline, is the responsibility of the appointed actuary.

The Immediate Drop Percentages and Gross Assumed Returns for each asset class are shown in Appendix I. The Gross Assumed Returns shown do not include deductions for asset based charges. Each company should deduct its own asset based charges from those shown to obtain the Net Assumed Returns to be used in determining the Projected Reduced Account Values.

Many variable annuity contracts provide for various types of Fixed Account options, in which underlying guarantees, consistent with General Account annuities, are provided. The fixed account should be projected as a separate asset class, with an Immediate Drop Percentage equal to zero and a Net Assumed Return equal to the guaranteed rate(s).

The Immediate Drop for each contract is determined by taking the sum of the immediate drops for each asset class. The Net Assumed Return for each contract is determined by taking the weighted average of the Net Assumed Returns for each asset class, based upon the allocation of the total account value between the asset classes.

E. Valuation Mortality and Interest

The mortality basis used to discount projected death benefits is the 1994 Group Annuity Mortality Basic Table (1994 GAMB), increased by 10% for margins and contingencies, without projection. This table, referred to as the 1994 Variable Annuity MGDB Mortality Table, is shown in Appendix II.

The valuation interest rates used for both the Separate Account Reserve and the Integrated Reserve should be annuity valuation interest rates, consistent with those required in the SVL and the VAR.

F. Reinsurance Reserve

1. Reinsurance Ceded

For contracts which reinsure some or all of the MGDB, an Integrated Reserve net of reinsurance must be calculated. This reserve should be calculated as outlined in Section IV.C., with the Integrated Benefit Streams being modified to reflect both the payment of future reinsurance premiums and the recovery of future reinsured death benefits. This is accomplished by treating the future reinsurance premium as an additional benefit and reducing the MGDB in the benefit stream of the Integrated Reserve calculation by future reinsurance recoveries.

Similar to the formula demonstrated in Section IV.C., the determination of future Integrated Benefit Streams including the impact of reinsurance is accomplished by combining four separate benefit streams: A^r , B^r , C and D, described below. These future Integrated Benefit Streams are determined over all Calculation Periods, and are discounted at the valuation interest rate.

- A^r is the stream of Projected Net Amounts at Risk paid to those expected to die during the Calculation Period, based on valuation mortality. It is equal to benefit stream A defined in Section IV.C., reduced by future Projected Net Amounts at Risk reinsurance recoveries.
- B^r is the benefit stream of Projected Unreduced Account Values paid to those expected to die during the Calculation Period, based on valuation mortality. It is equal to benefit stream B defined in Section IV.C., reduced by future Projected Unreduced Account Values reinsurance recoveries.
- C is as defined in Section IV.C.
- D is the stream of future projected reinsurance gross premiums during the Calculation Period, determined using Projected Reduced Account Values and discounted for survivorship, using valuation mortality.

The greatest present value occurs in the Calculation Period in which the present value of the future Integrated Benefit Streams, net of reinsurance, is maximized. This Calculation Period does not necessarily have to be the same as the Calculation Period which maximizes the Integrated Benefit Streams before consideration of reinsurance.

The reinsurance reserve credit the ceding company is entitled to is equal to the difference between the Integrated Reserve before any consideration of reinsurance and the Integrated Reserve net of reinsurance. The Integrated Reserve net of reinsurance may be greater than the Integrated Reserve before any consideration of reinsurance (i.e., the reserve credit may be negative).

2. Reinsurance Assumed

The reserve for reinsurers assuming MGDB risk is the maximum difference, at each Calculation Period, between the present value of the reinsured death benefits and the present value of reinsurance premiums.

Referring to the formulas above, the reinsured death benefit is the difference between the combination of benefit streams A^r and B^r , and the combination of benefit streams A and B, while benefit stream D represents the stream of reinsurance premiums defined above (i.e., $A - A^r + B - B^r - D$). Each of these

benefit streams is discounted using valuation mortality and interest assumptions consistent with those used by the ceding company.

The greatest present value occurs in the Calculation Period in which the difference between the present value of the reinsured death benefits and the present value of reinsurance premiums is maximized. This Calculation Period does not necessarily have to be the same as the Calculation Period which maximizes the Integrated Reserve, either before or after consideration of reinsurance.

G. Asset Adequacy Analysis Requirement

The Projected Reduced Account Value, and consequently, the Projected Net Amount at Risk, do not reflect future partial withdrawals. There is also the possibility that other risks may not be reflected in the reserve calculations described above. Therefore, the appointed actuary shall perform a standalone asset adequacy analysis of the total reserve held for all of the contracts falling within the scope of this Guideline. Such analysis shall be performed reflecting the assets supporting the total reserve held for the contracts and all benefits and guarantees associated with the variable annuity contracts, as well as all expenses and charges associated with the variable annuity contracts. The analysis shall be performed on an aggregate basis, consistent with the requirements of Section 6 of the NAIC Model Actuarial Opinion and Memorandum Regulation, including the requirement that the analysis conform to the Actuarial Standards of Practice as promulgated from time to time by the Actuarial Standards Board. However, no separate actuarial opinion is required by this Guideline. If such analysis reveals a reserve shortfall, the total reserves held for the contracts must be increased accordingly.

Where Minimum Guaranteed Death Benefits are reinsured, the asset adequacy analysis may reflect the reinsurance. However, if the inclusion of reinsurance would increase the Integrated Reserve, then reinsurance must be reflected in the asset adequacy analysis.

G.H. Effective Date

This Guideline affects all contracts issued on or after January 1, 1981. Where the application of this Guideline produces higher reserves than the company had otherwise established by their previously used interpretation, such company must comply with this Guideline effective December 31, 1998. However, such company may request a grace in period, of not to exceed three (3) years, from the domiciliary Commissioner upon satisfactory demonstration of the previous interpretation and that such delay of implementation will not cause a hazardous financial condition or potential harm to its policyholders.

APPENDIX I**Immediate Drop Percentages and Gross Assumed Returns**

ASSET CLASS	IMMEDIATE DROP PERCENTAGE	GROSS ASSUMED RETURN
Equity	14.00%	14.00%
Bond	6.50%	9.50%
Balanced	9.00%	11.50%
Money Market	2.50%	6.50%
Specialty	9.00%	9.50%

APPENDIX II

**1994 Variable Annuity MGDB Mortality Table
FEMALE Age Last Birthday**

AGE	1000q _x								
1	0.519	24	0.344	47	1.371	70	16.957	93	192.270
2	0.358	25	0.346	48	1.488	71	18.597	94	210.032
3	0.268	26	0.352	49	1.619	72	20.599	95	228.712
4	0.218	27	0.364	50	1.772	73	22.888	96	248.306
5	0.201	28	0.382	51	1.952	74	25.453	97	268.892
6	0.188	29	0.403	52	2.153	75	28.372	98	290.564
7	0.172	30	0.428	53	2.360	76	31.725	99	313.211
8	0.158	31	0.455	54	2.589	77	35.505	100	336.569
9	0.154	32	0.484	55	2.871	78	39.635	101	360.379
10	0.159	33	0.514	56	3.241	79	44.161	102	385.051
11	0.169	34	0.547	57	3.713	80	49.227	103	411.515
12	0.185	35	0.585	58	4.270	81	54.980	104	439.065
13	0.209	36	0.628	59	4.909	82	61.410	105	465.584
14	0.239	37	0.679	60	5.636	83	68.384	106	488.958
15	0.271	38	0.739	61	6.460	84	75.973	107	507.867
16	0.298	39	0.805	62	7.396	85	84.432	108	522.924
17	0.315	40	0.874	63	8.453	86	94.012	109	534.964
18	0.326	41	0.943	64	9.611	87	104.874	110	543.622
19	0.333	42	1.007	65	10.837	88	116.968	111	548.526
20	0.337	43	1.064	66	12.094	89	130.161	112	550.000
21	0.340	44	1.121	67	13.318	90	144.357	113	550.000
22	0.343	45	1.186	68	14.469	91	159.461	114	550.000
23	0.344	46	1.269	69	15.631	92	175.424	115	1000.000

APPENDIX II

**1994 Variable Annuity MGDB Mortality Table
MALE Age Last Birthday**

AGE	1000q _x								
1	0.587	24	0.760	47	2.366	70	29.363	93	243.533
2	0.433	25	0.803	48	2.618	71	32.169	94	264.171
3	0.350	26	0.842	49	2.900	72	35.268	95	285.199
4	0.293	27	0.876	50	3.223	73	38.558	96	305.931
5	0.274	28	0.907	51	3.598	74	42.106	97	325.849
6	0.263	29	0.935	52	4.019	75	46.121	98	344.977
7	0.248	30	0.959	53	4.472	76	50.813	99	363.757
8	0.234	31	0.981	54	4.969	77	56.327	100	382.606
9	0.231	32	0.997	55	5.543	78	62.629	101	401.942
10	0.239	33	1.003	56	6.226	79	69.595	102	422.569
11	0.256	34	1.005	57	7.025	80	77.114	103	445.282
12	0.284	35	1.013	58	7.916	81	85.075	104	469.115
13	0.327	36	1.037	59	8.907	82	93.273	105	491.923
14	0.380	37	1.082	60	10.029	83	101.578	106	511.560
15	0.435	38	1.146	61	11.312	84	110.252	107	526.441
16	0.486	39	1.225	62	12.781	85	119.764	108	536.732
17	0.526	40	1.317	63	14.431	86	130.583	109	543.602
18	0.558	41	1.424	64	16.241	87	143.012	110	547.664
19	0.586	42	1.540	65	18.191	88	156.969	111	549.540
20	0.613	43	1.662	66	20.259	89	172.199	112	550.000
21	0.642	44	1.796	67	22.398	90	188.517	113	550.000
22	0.677	45	1.952	68	24.581	91	205.742	114	550.000
23	0.717	46	2.141	69	26.869	92	223.978	115	1000.000

APPENDIX II

**1994 Variable Annuity MGDB Mortality Table
FEMALE Age Nearest Birthday**

AGE	1000q _x								
1	0.628	24	0.344	47	1.316	70	16.239	93	184.435
2	0.409	25	0.344	48	1.427	71	17.687	94	201.876
3	0.306	26	0.348	49	1.549	72	19.523	95	220.252
4	0.229	27	0.356	50	1.690	73	21.696	96	239.561
5	0.207	28	0.372	51	1.855	74	24.107	97	259.807
6	0.194	29	0.392	52	2.050	75	26.832	98	281.166
7	0.181	30	0.415	53	2.256	76	29.954	99	303.639
8	0.162	31	0.441	54	2.465	77	33.551	100	326.956
9	0.154	32	0.470	55	2.713	78	37.527	101	350.852
10	0.155	33	0.499	56	3.030	79	41.826	102	375.056
11	0.163	34	0.530	57	3.453	80	46.597	103	401.045
12	0.175	35	0.565	58	3.973	81	51.986	104	428.996
13	0.195	36	0.605	59	4.569	82	58.138	105	456.698
14	0.223	37	0.652	60	5.250	83	64.885	106	481.939
15	0.256	38	0.707	61	6.024	84	72.126	107	502.506
16	0.287	39	0.771	62	6.898	85	80.120	108	518.642
17	0.309	40	0.839	63	7.897	86	89.120	109	531.820
18	0.322	41	0.909	64	9.013	87	99.383	110	541.680
19	0.331	42	0.977	65	10.215	88	110.970	111	547.859
20	0.335	43	1.037	66	11.465	89	123.714	112	550.000
21	0.339	44	1.091	67	12.731	90	137.518	113	550.000
22	0.342	45	1.151	68	13.913	91	152.286	114	550.000
23	0.344	46	1.222	69	15.032	92	167.926	115	1000.000

APPENDIX II

**1994 Variable Annuity MGDB Mortality Table
MALE Age Nearest Birthday**

AGE	1000q _x								
1	0.701	24	0.738	47	2.246	70	28.068	93	234.658
2	0.473	25	0.782	48	2.486	71	30.696	94	255.130
3	0.393	26	0.824	49	2.751	72	33.688	95	276.308
4	0.306	27	0.860	50	3.050	73	36.904	96	297.485
5	0.280	28	0.892	51	3.397	74	40.275	97	317.953
6	0.268	29	0.922	52	3.800	75	44.013	98	337.425
7	0.257	30	0.948	53	4.239	76	48.326	99	356.374
8	0.238	31	0.971	54	4.706	77	53.427	100	375.228
9	0.230	32	0.992	55	5.234	78	59.390	101	394.416
10	0.233	33	1.003	56	5.854	79	66.073	102	414.369
11	0.245	34	1.004	57	6.601	80	73.366	103	436.572
12	0.267	35	1.006	58	7.451	81	81.158	104	460.741
13	0.302	36	1.020	59	8.385	82	89.339	105	484.644
14	0.352	37	1.054	60	9.434	83	97.593	106	506.047
15	0.408	38	1.111	61	10.629	84	105.994	107	522.720
16	0.463	39	1.182	62	12.002	85	115.015	108	534.237
17	0.509	40	1.268	63	13.569	86	125.131	109	542.088
18	0.544	41	1.367	64	15.305	87	136.815	110	546.908
19	0.573	42	1.481	65	17.192	88	150.191	111	549.333
20	0.599	43	1.599	66	19.208	89	164.944	112	550.000
21	0.627	44	1.725	67	21.330	90	180.886	113	550.000
22	0.658	45	1.867	68	23.489	91	197.834	114	550.000
23	0.696	46	2.037	69	25.700	92	215.601	115	1000.000

APPENDIX III

Description of Asset Classes

Equity Class

Although equity funds have a broad range of investment objectives, all invest primarily in publicly traded securities, such as common stocks, preferred stocks and convertible securities. The choice of securities purchased by the portfolio manager will be guided by the fund objective (such as Growth of Capital or Income, or Approximating an Index), the capitalization of the companies issuing the stock (e.g., small, medium or large) or the target region (domestic U.S., Pacific Rim, Latin America, etc.). Although some equity funds maintain a general strategy, allowing a portfolio manager great latitude in purchase, other equity funds have become quite specific in their investment objectives. All equity funds, however are somewhere on the high end of the risk/return scale.

Bond Class

Investment objective is usually to provide a high level of income consistent with moderate fluctuations in principal value. The objective is accomplished through investments in fixed income securities, such as U.S. government securities, foreign government securities, or publicly traded debt securities issued by U.S. or foreign corporations. Since most bonds are assigned ratings by private Rating Agencies, the specific objectives of the funds are often described by the funds' tolerance for instruments at the various rating levels. Funds that focus predominantly on safety will tend to use more U.S. Government securities, while a fund that focuses predominantly on income may tend to use more lower investment grade instruments. All bond funds, however, are somewhere in the midrange of the risk/return scale.

Balanced Class

Investment objective is to seek a maximum total return over time, consistent with an emphasis on both capital appreciation and income. Typically, these funds will contain 50%-75% stocks, with the remaining assets invested in bonds and cash equivalents. However, balanced funds grant the portfolio manager the latitude to shift the asset allocation depending on a current analysis of market trends. Beside the term "Balanced," common terms for this fund type include "Total Return," "Adviser's" and "Asset Allocation."

Money Market Class

Investment objective is to achieve maximum current income consistent with liquidity and preservation of capital. These funds typically aim to maintain a stable net asset value of \$1 per share. The assets contained in this fund typically have a stated maturity of less than thirteen months with an average maturity of less than 90 days. Common assets held include U.S. Government obligations, certificates of deposit, time deposits and commercial paper.

Specialty Class

Investment objective is to seek a maximum total return with an emphasis on long term capital appreciation, and sometimes current income. Typically, this fund type will invest most of its assets in common stocks or debt instruments of companies that operate within a specified industry. Commonly, specialty funds invest in utilities, natural resources and real estate, although there is a broad range of possible industries to choose from. The key difference between a specialty fund and an equity or bond fund is the targeted approach to investing. In a specialty fund, no effort is made to diversify outside the target industry.