

**LHATF Conference Call on Reserve and RBC Requirements for Variable Annuities**

Mr. Dennis Lauzon of NY has prepared a draft on the proposed standard scenarios that can be used to calculate the basic reserve and RBC requirements for variable annuities. The purpose of the conference call is to discuss (a) whether there is a need for such standard scenarios, (b) the uses of standard scenarios, and (c) the reasonableness of the proposed assumptions of the standard scenarios. Readers are recommended to read "Lauz0115.doc" for more details.

Regulators on the call included NY, FL, MN, PA, UT, OH, IL and others. Other participants were insurance companies, ACLI, and other interested parties.

**Advantages of Standard Scenarios:**

1. During a model process, insurance companies normally group in force policies into liability cells to form liability model offices. If projections are performed for both liability model offices and seriatim records under the same set of standard scenarios, one may use the projected results to (a) study the reasonableness of the model process and (b) validate the liability model office.
2. Insurance companies may track the projected results because the assumptions for the standard scenarios are relatively static.
3. The assumed equity returns under the standard scenarios are adverse equity returns (similar to AG 34 assumed equity return). Insurance companies and regulators may use the projected results to examine the reserve and capital needs in accordance with the underlying risk profile.
4. One may use the standard scenario reserve as the reserve floor.
5. One may also use the seriatim reserve under the standard scenario as a mean to allocate the aggregate stochastic reserve to individual policies.

**Comments from Regulators and Interested Parties**

1. Insurance companies should not be allowed to switch between formulaic reserve and stochastic reserve so as to avoid higher statutory reserves. The current proposal indicates that once stochastic method is selected, an insurance company is not allowed to switch back to formulaic reserve unless the insurance company has a good reason for doing so and regulators approve such a change.
2. Regulators indicated that the current reserve and RBC requirements are applicable to all variable annuities with death benefit or living benefit guarantees.
3. NY wants to use the standard scenario reserve as the reserve floor.
4. An interested party indicated that the proposed scenario approach might not be appropriate for RBC because RBC focuses on extreme values. Regulators may consider using factors to determine the RBC requirement.



5. CT indicated that it is desirable to have a reserve floor. If insurance companies are using the stochastic scenario approach, it is difficult to audit the results due to lack of uniformity. The standard scenario should be the same for every company so as to avoid modeling disparities among insurance companies.
6. It is desirable that the assumptions within the standard scenarios are reasonable and not overly conservative. If the assumptions are very conservative, it is possible that the resulting reserve is even higher than the required RBC.
7. Some interested parties indicated that there might be practical challenges to incorporate the assumptions under the standard scenarios into their existing valuation software packages.
8. An interested party indicated that some small insurance companies prefer to use factors rather than the stochastic process to determine reserve and RBC requirements.

#### Assumptions of the Standard Scenarios

1. The basic reserve is an AG33 type contract-by-contract reserve assuming no GMDB and VAGLB. The basic reserve will be used as the reserve floor.
2. Discount rate for reserve is the dynamic rate: the 10 Year CMT plus 50 basis points. Discount rate for RBC is 65% of the dynamic rate.
3. The assumed equity return of the standard scenario is based on the average equity return of the 10 worst scenarios.
4. The assumed equity returns in years 2 and later is discount rate plus 1%.
5. The assumed equity return for balance fund is 60% of equity return under the standard scenario. This is based on the assumption that balance fund is made up of 60% equity and 40% fixed fund.

#### Comments from Regulators and Other Interested Parties

1. The discount rate is based on 10 Year CMT. In a low interest rate environment, the assumed equity return in years 2 and later may still be less than variable annuity premium roll-up rate. In a higher interest rate environment, the assumed equity returns in years 2 and later may be higher than the premium roll-up rate and may lead to significantly higher reserve.
2. An inverted yield curve may also lead to an increase in the 10 Year CMT while the equity return may not be as attractive.
3. For policies whose guarantees are out of the money at the valuation date, the guarantees may be in the money in the future due to the assumed equity returns in years 2 and later under the standard scenario.
4. There should be caps on the discount rate and the associated equity returns in years 2 and later.



Due to time constraints, the conference call came to an end. The remaining issues will be discussed in the next call on February 27, 2004.

Vincent Tsang, FSA, MAAA

28 January 2004



Dennis Lauzon, NY  
1/15/04

Standard Scenarios (Version 4 Draft Dennis Lauzon NY 1/15/04)

Asset requirements under the standard scenarios are to be determined for all applicable inforce, including inforce where reserves or RBC is based on formulaic factors. There is one standard scenario for reserves and one standard scenario for RBC. The standard scenarios are to be applied to the inforce at the end of the year on a seriatim basis. The reserve standard scenario result for a contract is the greater of the amount calculated and the basic reserve for the contract, see the next paragraph. The RBC standard scenario is subject to an aggregate floor equal to the reserve standard scenario. A company that uses an inforce prior to year end as part of the process to determine RBC or reserves must also run the standard scenarios on a seriatim basis on that inforce. If a company is using a model office to develop RBC or reserves the standard scenarios must also be run on the model office for comparison with the seriatim run.

The basic reserve for a contract is the reserve resulting from the application of Actuarial Guideline 33 assuming there are no guaranteed death benefits or guaranteed living benefits.

Where not inconsistent with the guidance given here, the process and methods used to determine results under the standard scenarios must be the same as that provided for in the instructions for RBC or reserves (e.g., a greatest present value analysis).

Reserves and RBC at yearend can not be less than the amounts calculated under the standard scenarios.

Any additional assumptions needed to apply the standard scenarios to the inforce are to be explicitly documented.

Discount Rates

A dynamic rate, DR, is based on the 10-year constant maturity treasury rate for the month of valuation as reported by the Federal Reserve. DR is the annual equivalent of the reported rate plus 50 basis points. As an example, for a 12/31/03 valuation, the Federal Reserve January 5, 2004 HR15 release has a "Dec 2003" 10-year constant maturity treasury rate of 4.27%. This is 4.32% on an annual effective basis, so DR would be 4.82%. If this rate is not available from the Federal Reserve, the actuary should approximate this rate from other sources and document the approximation.

Discounting for the standard reserve scenario is at the dynamic rate.



Account Return Assumptions

The “Initial” return given below is an immediate drop applied to account values. Yearly return assumptions are given as annual effective rates of return. All contractholder account values are to be accumulated using net return assumptions. The returns for equity, bond and balance funds are given as gross return assumptions. The net return is the gross return less all investment fund charges based on account value and all contract charges based on account value. The returns for general account and fixed separate accounts are given as net returns.

	Initial	Year 1	Year 2+
<b>RBC Scenario</b>			
Equity Class (AG34 Equity and Specialty)	-10%%	-10%	DR
Bond Class (AG34 Bond and Money Mkt.)	0	0	DR
Balanced Class	-6%	-6%	DR
Fixed Separate Accounts and General Account (net)		Guarantee Rate	Guarantee Rate
<b>Reserve Scenario</b>			
Equity Class	-(DR+1%)	DR+1%	DR+1%
Bond Class	0%	0	DR
Balanced Class	-.6(DR+1%)	.4x(DR+1%)	DR+.6%
Fixed Separate Accounts and General Account (net)		Guarantee Rate	Guarantee Rate

Initial Assets and Asset Return Assumptions

Initial assets for the scenarios are equal to the account values. Assets supporting fixed accounts earn the guaranteed rate. Assets supporting other funds earn the gross rate less fund charges based on account value plus any contractual right to a share of fund charges guaranteed to the insurer or its successor for the life of such contracts.

The Value of Hedges

The value of hedges, including purchases in the first year from the valuation date, is to be calculated separately from the seriatim run. Aggregate seriatim requirements are adjusted by the value of hedges but not below aggregate basic reserves. The value of hedges is the discounted value of estimated cash flows (pre tax flows and discount rates for reserves and post tax cash flows and discount rates for RBC) from approved hedges less the current statement value of approved hedges.

Approved hedges are hedges acquired and held to support the business being tested in accordance with an investment policy that has been implemented for at least 6 months and has



been approved by the Board of Directors or a subcommittee of Board members. A copy of the committee’s resolution approving the policy and a copy of the policy must be maintained with the documentation of the standard scenario and available on request. The commissioner of the state of domicile may disallow the value of hedges if investment activity over the prior year has not been consistent with the hedge activity modeled or if operational implementation of policy is deemed inadequate (e.g., not consistently implemented throughout the year).

Hedge value may include the cost and gains on estimated future approved hedges purchased within one year from the valuation date if such hedges are consistent with the current investment strategy and in accordance with the approved investment policy. However, the total adjustment may not exceed twice the adjustment that would result without new purchases. All hedges may be liquidated by the end of the first year.

Where applicable, the valuation of hedges should be consistent with Black-Scholes pricing, a risk free rate equal to DR and annual volatility of 20% for equity markets.

Lapses & Partial Withdrawals

No partial withdrawals occur in the standard scenario and all lapses should be modeled as policy lapses. Policy lapses are given as annual effective rates. A contract is in the money if it includes a guaranteed benefit that is exercisable or payable on a contingent basis and the current account value accumulated at the roll up rate for the benefit, if any, would at any time be less than the statement value of the guaranteed benefit.

**RBC & Reserves**

	During the Surrender Charge Period		After the Surrender Charge Period	
	In the Money	Out of the money	In the Money	Out of the money
Policy Lapse	3%	5%	7%	15%

Account Transfers and Future Premiums

No account transfers between funds should be assumed unless required by contract (e.g., transfers from a dollar cost averaging fund). When transfers must be modeled, to the extent not inconsistent with contract language the allocation of transfers to funds must be in proportion to the contracts current allocation to funds.

No future premium deposits should be assumed unless required by the terms of the contract (e.g., premiums on reinsurance assumed). When premium deposits must be modeled, to the extent not inconsistent with contract language the allocation of premiums to funds must be in proportion to the contracts current allocation to funds.

Mortality

For blocks of business where RBC is based on stochastic modeling, mortality at 90% of the MGDB tables age nearest birthday must be used in the standard scenario. For all other blocks of business mortality at 100% of the MGDB tables age nearest birthday must be used in the standard scenario.

#### Expenses, Revenue & Reinsurance

The standard reserve scenario should be on a pre-tax basis excluding all expenses including the amortization of the statement value of a CARVM allowance. No revenue from expense charges including surrender charges should be assumed. Revenue is limited to the excess of asset returns over account value returns.

Reinsurance premiums payable on ceded risk and receivable on assumed risk must be included in the projection. Similarly reinsurance benefits receivable on ceded risk and payable on assumed risk must be included in the projection.

The standard RBC scenario should treat expenses and reinsurance as in the reserve scenario except that the resulting yearly income should be adjusted to a post-tax basis assuming a tax rate of 35%.

#### Contractholder Election Rates

Contractholder election rates should be at 15% per annum for any in the money benefit subject to election, but only to the extent such election does not terminate a more valuable benefit. Contractholder election rates should be 100% at the last opportunity to elect an in the money benefit, but only to the extent such election does not terminate a more valuable benefit. A benefit is more valuable if it is more in the money.

#### GMIB Cost

GMIB cost at the time of election is to be based on the excess of the reserve required over the account value. The reserve is to be determined using the 2000 Annuity Mortality and a valuation interest rate equal to DR. If several annuity options are available, the company should assume the annuity option with a reserve closes to the reserve for a life annuity with 10 years of certain payments.

#### Guaranteed Account & C3P1 Requirements

The risk based capital, if any, required to support the rate credited on a fixed account in the RBC standard scenario must be determined and added to the RBC standard scenario requirement.

A C3P1 analysis is to be carried out on the fixed funds (not the entire contract) where the contract cash flows to and from the fixed funds under the standard scenario are taken as



guaranteed cash flows and the fixed account value is treated as a reserve. The initial assets supporting the fixed account are those used in cash flow testing with the return on new fixed income investments determined by the C3P1 interest scenarios. The standard scenario discount rates are to be used in the C3P1 analysis to determine the greatest present value of additional amounts needed, if any, to keep the supporting assets above the account value.

NOTES:

The standard scenarios can be thought of as an AG34 type requirement modified for a specific benefit stream, specific assumptions, allowance for hedges and appropriate adjustments to put the RBC requirements on an after tax basis.

The chart below compares the equity wealth ratios for the standard scenario under different DRs to the average wealth ratios for the worst 10% of scenarios in the U.S. diversified equity pre-packaged scenarios. (Note the pre-packaged scenarios were resorted for each target year to find the average of the 10% worst scenarios.) Also note that a variety of equity funds would offer diversification benefits not apparent from examining only U.S. diversified equity.

	Average Worst 10%	Std. Scenario DR=4.82%	Std. Scenario DR=7%
1 year	0.81	0.80	0.80
2 year	0.78	0.84	0.86
5 year	0.84	0.97	1.05
10 year	1.07	1.22	1.47
20 year	2.06	1.96	2.89

The following is a similar chart for the reserve scenario.

	Average Worst 35%	Std. Scenario DR=4.82%	Std. Scenario DR=7%	AG34 (DR=13%)
1 year	0.94	1.00	1.00	1.00
2 year	0.98	1.06	1.08	1.14
5 year	1.17	1.25	1.36	1.69
10 year	1.69	1.66	2.00	3.25
20 year	3.89	2.93	4.32	12.06

The following is the prepackaged diversified fixed income averages for the scenarios correlated to the diversified equity scenarios (i.e., 10% worst is from the scenarios correlated to the 10% worst equity scenarios).

	Average Worst 10% Equity	Standard Scenario DR=4.8 2%	Average Worst 35% equity	Standard Scenario DR=7%
1 year	1.03	1.00	1.03	1.00
2 year	1.07	1.05	1.07	1.07
5 year	1.19	1.21	1.20	1.31
10 year	1.49	1.53	1.49	1.84
20 year	2.53	2.45	2.55	3.62

The following compares the lapse assumptions in the standard scenarios to the lapse assumptions in the modeling underlying the formulaic factors (the actual factors are based on a flat 10% lapse rate). SC is the surrender charge in the modeling underlying the formulaic factors. If the account value (AV) is greater than 91% of the guarantee value (GV), the basic lapse rates are assumed. If the account value is less than 67% of the guarantee value the minimum lapse rates apply. Lapse rates are graded for intermediate values in the modeling underlying the formulaic factors.

Year	Modeling Assumptions			Standard Scenario	
	SC	AV>.91GV Basic Lapse Rates	AV<.67GV Min. Lapses Rates	AV>GV Lapses	AV<GV Lapses
1	7%	1.50%	0.75%	5%	3%
2	6%	4.00%	2.00%	5%	3%
3	5%	4.00%	2.00%	5%	3%
4	4%	4.00%	2.00%	5%	3%
5	3%	6.00%	3.00%	5%	3%
6	2%	8.00%	4.00%	5%	3%
7	1%	10.00%	5.00%	5%	3%
8	0%	30.00%	15.00%	15%	7%
9	0%	20.00%	10.00%	15%	7%
10+	0%	10.00%	5.00%	15%	7%

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