



VARWG December 2004 Analysis Report

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- Reduction in Basic Annuity Charge to 1.15%

Attachment 3: Model vs. Standard Scenario

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Attachment 1 -- Modeling vs. Standard Scenario
1.50% Product with No GMIB

Notes: 4 Death Benefit Population
 No GMIB Modeled
 Usual Product Modeling Specs (including Basic Annuity Charge of 1.50%)
 August Standard Scenario Specs; assumes that Basic Reserve is CSV (not AG33)

	Account Value	748,930,000
	CSV	725,054,940
	Addl Rx	AAR
Model Results		
Seriatim	10,485,354	18,076,328
Aggregate	3,287,390	8,811,138
Standard Scenario		
Seriatim	11,309,454	18,891,735
Aggregate*	322,535	8,990,918

Expressed as % of AV

Model Results		
Seriatim	1.40%	2.41%
Aggregate	0.44%	1.18%
Standard Scenario		
Seriatim	1.51%	2.52%
Aggregate*	0.04%	1.20%

Note: * aggregation used is same for both Addl Rx and AAR

Attachment 2 -- Modeling Results with Changes to Revenue / Benefits

4 Death Benefit Population
 Account Value (\$MM) \$ 748.9

GMDB Only; No GMIB Modeled
 Basic Annuity Charge of 1.50%

	Addl Rx		AAR	
	<u>\$ in MM</u>	<u>% AV</u>	<u>\$ in MM</u>	<u>% AV</u>
Seriatim	\$ 10.49	1.40%	\$ 18.08	2.41%
Aggregate	\$ 3.29	0.44%	\$ 8.81	1.18%

5% R/U GMDB combined with 5% R/U GMIB; No change to other types
 Basic Annuity Charge of 1.50%

	Addl Rx		AAR	
	<u>\$ in MM</u>	<u>% AV</u>	<u>\$ in MM</u>	<u>% AV</u>
Seriatim	\$13.66	1.82%	\$23.04	3.08%
Aggregate	\$4.69	0.63%	\$12.36	1.65%

5% R/U GMDB combined with 5% R/U GMIB; No change to other types
 Basic Annuity Charge of 1.15%

	Addl Rx		AAR	
	<u>\$ in MM</u>	<u>% AV</u>	<u>\$ in MM</u>	<u>% AV</u>
Seriatim	\$16.54	2.21%	\$26.37	3.52%
Aggregate	\$7.97	1.06%	\$18.00	2.40%

Attachment 3: Model vs. Std. Scenario (1.15% with 5% Combined GMDB / GMIB)

No Shock to Initial Account Value

AV = \$ 748.9

		Addl Rx		AAR	
Model Results		\$ in MM	% AV	\$ in MM	% AV
	Seriatim	\$16.54	2.21%	\$26.37	3.52%
	Aggregate	\$7.97	1.06%	\$18.00	2.40%
Standard Scenario		\$	%	\$	%
	Seriatim	\$ 17.37	2.32%	\$ 26.63	3.56%
	Modified Seriatim	\$ 15.71	2.10%	\$ 25.91	3.46%
	Aggregate	\$ 0.84	0.11%	\$ 17.98	2.40%

Shock Initial Account Value UP 20%

AV = \$ 898.7

		Addl Rx		AAR	
Model Results		\$ in MM	% AV	\$ in MM	% AV
	Seriatim	\$7.46	0.83%	\$15.39	1.71%
	Aggregate	\$2.42	0.27%	\$6.58	0.73%
Standard Scenario		\$	%	\$	%
	Seriatim	\$ 6.21	0.69%	\$ 13.77	1.53%
	Modified Seriatim	\$ 3.59	0.40%	\$ 12.45	1.39%
	Aggregate	\$ -	0.00%	\$ -	0.00%

Shock Initial Account Value DOWN 20%

AV = \$ 599.1

		Addl Rx		AAR	
Model Results		\$ in MM	% AV	\$ in MM	% AV
	Seriatim	\$ 35.26	5.89%	\$ 43.98	7.34%
	Aggregate	\$ 25.95	4.33%	\$ 36.84	6.15%
Standard Scenario		\$	%	\$	%
	Seriatim	\$ 38.96	6.50%	\$ 45.02	7.51%
	Modified Seriatim	\$ 38.16	6.37%	\$ 44.63	7.45%
	Aggregate	\$ 27.14	4.53%	\$ 40.84	6.82%

Notes to Standard Scenario

Based on August Specs

Using CSV instead of AG33 as Basic Reserve

Aggregate Results are obtained by first summing respective year-ends across all cells and then finding LPV

Modified Seriatim is obtained by first finding LPV for specific cells but allowing negatives and then summing all

Dynamic Rate is based on 10 Yr UST from December 2003; DR = 4.82%

Attachment 4: CTE Equivalents for Standard Scenario Results

Note: Results are for product with basic annuity charge of 1.15% and for 5% Rollup GMDB with GMIB (other benefit types have no VAGLB). Standard Scenario uses a DR of 4.82%.

Shock to Initial Account Value	<u>Up 20%</u>	<u>None</u>	<u>Down 20%</u>
	\$ 898.72	\$ 748.93	\$ 599.14
Additional Reserve			
Standard Scenario (Seriatim)	\$ 6.21	\$ 17.37	\$ 38.96
as % AV	0.69%	2.32%	6.50%
Modeled Results (Aggregate)			
CTE 85	\$ 5.64	\$ 17.88	\$ 42.39
as % AV	0.63%	2.39%	7.07%
CTE 80	\$ 4.23	\$ 13.84	\$ 36.62
as % AV	0.47%	1.85%	6.11%
Additional Asset Requirement			
Standard Scenario (Aggregate)	\$ -	\$ 17.98	\$ 40.84
as % AV	0.00%	2.40%	6.82%
Modeled Results (Aggregate)			
CTE 95	\$ 13.01	\$ 27.34	\$ 47.73
as % AV	1.45%	3.65%	7.97%
CTE 90	\$ 6.58	\$ 18.00	\$ 36.84
as % AV	0.73%	2.40%	6.15%

Attachment 5: Impact of Dynamic Rate on Standard Scenario Results

Shock to Initial AV	<u>Up 20%</u>	<u>None</u>	<u>Down 20%</u>
Seriatim Addl. Reserve			
4.82%	0.69%	2.32%	6.50%
8.67%	0.33%	1.38%	4.47%
Aggregate AAR			
4.82%	0.00%	2.40%	6.82%
8.67%	0.00%	0.49%	2.75%

Notes:

The Dynamic Rate, DR, is used for discounting in both Additional Reserve and AAR along with the Ultimate Grow Back rate for Equity in AAR

The Dynamic Rate of 8.67% is based on 75th Percentile of 10 Yr UST from April 1953 through July 2004 while the 4.82% uses the average 10Yr UST for December 2003.

Attachment 6: Other Analysis

A) Decrease in Equity Returns Used in Modeling

Note: To simulate the effect of a change to the calibration criterion, each quarterly equity return was decreased by either 0.25% or 0.50% (1% or 2% on an annualized basis)

Product has 1.15% Basic Annuity Charge and uses the combined 5% Roll-up GMDB / GMIB

	Modeled Results as a % of Account Value			
	Add'l Rx			AAR
No Adjustment to Equity Returns				
Seriatim	2.21%			3.52%
Aggregate	1.06%			2.40%
Equity Returns Down by 1%		% No Adjust.		% No Adjust.
Seriatim	2.59%	117%		4.08% 116%
Aggregate	1.34%	126%		2.94% 123%
Equity Returns Down by 2%				
Seriatim	3.05%	138%		4.69% 133%
Aggregate	1.69%	159%		3.57% 149%

B) Comparison AG33 Reserves with Cash Surrender Value

Note: AG 33 Reserves are continuous floored at the cash surrender value and were calculated ignoring the paths that involved partial withdrawals; the valuation interest rate and mortality table depended on the calendar year of issue.

Although the Standard Scenario calls for the use of the AG 33 reserve, the analysis on the Standard Scenario used the expedient assumption that the AG33 reserve equaled the cash surrender value, which **understates** the amounts that are required under the Standard Scenario.

Shock to Initial	<u>Up 20%</u>	<u>None</u>	<u>Down 20%</u>
Premium	\$ 686.3	\$ 686.3	\$ 686.3
AV	\$ 898.7	\$ 748.9	\$ 599.1
CSV	\$ 875.3	\$ 725.0	\$ 574.7
AG33	\$ 876.4	\$ 726.6	\$ 578.0
Ratio of (AG33 - CSV)/ AV	0.12%	0.22%	0.55%

Attachment 7: Calibration: S&P 500 vs. World (ex Japan) Index

AAA LCAS C3 Phase II RBC for Variable Annuities

RSLN2 Calibration Table

November 18, 2004

		1	2	3	4	5
Index#	5	S&P500	S&P500	S&P500	World ex Japan	S&P500
	Date1	1952.12	1953.12	1969.12	1969.12	1952.12
	Date2	2002.12	2003.12	2003.12	2003.12	2002.12
0.01200	μ_1	0.01279	0.01359	0.01415	0.01380	0.01200
0.03468	σ_1	0.03483	0.03485	0.03648	0.03213	0.03468
0.03529	ρ_{1-2}	0.03397	0.03998	0.05139	0.04548	0.03529
-0.01145	μ_2	-0.00996	-0.01178	-0.01546	-0.02456	-0.01145
0.06295	σ_2	0.06377	0.06380	0.06906	0.06847	0.06295
0.15436	ρ_{2-1}	0.15297	0.19210	0.23486	0.23223	0.15436
0.8139	π_1	0.8183	0.8277	0.8205	0.8362	0.8139
0.1861	π_2	0.1817	0.1723	0.1795	0.1638	0.1861
9.16%	μ_A	10.39%	11.06%	10.60%	9.02%	9.16%
14.69%	σ_A	14.73%	14.69%	15.79%	14.83%	14.69%
-0.401	γ	-0.391	-0.426	-0.501	-0.801	-0.401
10	E[R]	12.51%	13.23%	12.92%	11.20%	11.15%
5.44%	Sharpe	0.4799	0.5309	0.4742	0.3890	0.3890

	Sharpe Constrained for S&P 1952 - 2002			Calibration Table (MLE S&P500 1952-2002)		
	1	5	10	1	5	10
0.50%	0.635	0.497	0.516	0.650	0.540	0.600
1.00%	0.680	0.569	0.615	0.690	0.620	0.720
2.50%	0.751	0.689	0.790	0.760	0.750	0.930
5.00%	0.816	0.806	0.973	0.830	0.870	1.130
10.00%	0.890	0.957	1.226	0.900	1.030	1.410
50.00%	1.112	1.624	2.572	1.125	1.726	2.907
90.00%	1.327	2.518	4.906	1.340	2.670	5.550
95.00%	1.392	2.826	5.821	1.410	3.010	6.570
97.50%	1.451	3.118	6.731	1.470	3.310	7.550
99.00%	1.523	3.490	7.946	1.540	3.710	8.910
99.50%	1.575	3.765	8.882	1.590	4.000	10.000

Attachment 8: Population Summary

GMDB Type	ROP	MAV	5% R/U	Combo	All
GMIB	none	none	5% R/U	none	
Number of Cells	86	91	72	72	321
Premium	\$ 216.0	\$ 276.2	\$ 55.6	\$ 138.5	\$ 686.3
GMDB Value	\$ 216.0	\$ 315.1	\$ 71.0	\$ 156.5	\$ 758.6
Acct Value					
Up 20%	\$ 313.0	\$ 347.5	\$ 72.5	\$ 165.8	\$ 898.7
No Adjust	\$ 260.8	\$ 289.6	\$ 60.4	\$ 138.2	\$ 748.9
Down 20%	\$ 208.6	\$ 231.7	\$ 48.3	\$ 110.5	\$ 599.1
Acct Value by Age					
Under 65	40.6%	43.9%	45.6%	43.2%	42.8%
From 65 upto 70	10.5%	20.1%	10.0%	25.3%	16.9%
From 70 upto 75	15.0%	15.2%	16.7%	12.1%	14.7%
From 75 upto 80	11.1%	14.1%	14.8%	14.9%	13.3%
From 80 upto 95	22.8%	6.6%	12.8%	4.4%	12.3%
	100.0%	100.0%	100.0%	100.0%	100.0%
Contract NAR on Val Date					
Up 20%	\$ 2.3	\$ 12.1	\$ 5.5	\$ 10.1	\$ 30.0
No Adjust	\$ 10.5	\$ 35.7	\$ 13.1	\$ 23.3	\$ 82.5
Down 20%	\$ 32.8	\$ 83.8	\$ 23.2	\$ 46.0	\$ 185.8
In The Money					
Up 20%	0.75%	3.47%	7.63%	6.09%	3.96%
No Adjust	4.02%	12.31%	21.71%	14.86%	10.88%
Down 20%	15.74%	36.16%	48.02%	41.59%	24.49%
Associated One Yr Term Cost (using level NAR on Val Date, 100% 1994 MGDB Table, and no interest)					
Up 20%	\$ 0.10	\$ 0.39	\$ 0.15	\$ 0.29	\$ 0.93
as % AV	0.03%	0.11%	0.21%	0.17%	0.10%
No Adjust	\$ 0.45	\$ 1.17	\$ 0.38	\$ 0.69	\$ 2.69
as % AV	0.17%	0.40%	0.63%	0.50%	0.36%
Down 20%	\$ 1.40	\$ 2.62	\$ 0.70	\$ 1.33	\$ 6.05
as % AV	0.67%	1.13%	1.45%	1.20%	1.01%

Attachment 9: Modeling Specs

Standard Product:

Basic Annuity Charge (M&E): 1.50% or 1.15%, as indicated

Annual Fee: None

Surrender Charge is 7% of premium in first contribution year, down by 1% per year, with a Free Withdrawal Amount equal to 10% of Account Value (non-cumulative).

Basic Death Benefit: waiver of surrender charges

Max. Annuitization Age: All policies terminate at age 95

Optional Guaranteed Minimum Death Benefits:

Return of Premium: charge is 0.05% of account value

5% Roll-up: Premium accumulated continuously at 5% interest; roll-up frozen at age 80 or 250% of premium, if earlier; charge is 0.20% of account value

Max Annual Value (Annual Ratchet): frozen at age 80; charge is 0.15% of account value

High or Combo: greater of 5% Roll-up or Max Anniv. Value; charge is 0.25% of account value

Optional Guaranteed Minimum Income Benefit:

Waiting Period: later of attained age 60 or 7 years after issue

Restrictions: can be elected only on contract anniversary; cannot be elected after age 85

Guaranteed Annuity Option: 15 year annuity certain with interest at 3%

Cost of Annuitization: is the excess of the current cost of guaranteed income (using 7 Year Treasury for scenario plus 0.35%) over the Account Value; never negative.

5% Roll-up GMIB: Premium accumulated continuously at 5% interest; roll-up frozen at age 80 or 250% of premium, if earlier; charge is 0.35% of benefit base

Experience Assumptions:

Mortality: 65% of 1994 MGDB Table (ALB)

Base Lapse Rates:

Policy Yr.	1	2	3	4	5	6	7	8	9	10+
Lapses	1.5%	4%	4%	4%	6%	8%	10%	30%	20%	10%

Attachment 9: Modeling Specs (con't.)

Dynamic Lapse Multiplier: The actual lapse rate is the product of the base lapse rate and the dynamic lapse multiplier. The dynamic lapse adjustment depends on the ratio of Guaranteed Value to Market Value (GV / MV) and is calculated separately for the GMDB and GMIB, if any. If both benefits are on the contract, then the large ratio is used. The dynamic adjustment has a value of 1 when the ratio is 1.1 or less and grades linearly to a value of 50% when the ratio of GV / MV is 1.5.

Partial Withdrawals: Ignored

GMIB Utilization: This depends on attained age and the ratio GV / MV, with a special adjustments on the first and last anniversaries on which the customer is eligible to elect the benefit. The maximum utilization rate is 10% at age 60 through 65, grading linearly to 20% at age 70 and remaining at 20% through age 79. Thereafter, it grades linearly down to 10% at age 84 and remaining level thereafter. On the first eligibility date the cap is never less than 15% and equals 20% on the last eligibility date.

The utilization rate is assumed to be 0% when the ratio of GV / MV is less than 1 and equal to the base annuitization rate of 5% when the ratio is between 1 and 1.1. For higher values of the ratio, the utilization rate is 5% plus a dynamic factor. The dynamic factor adds 2% to the utilization rate for each 10% that the benefit goes deeper “in the money”. For example, when the GV / MV ratio is 1.8, the utilization rate is (before applying any cap) is 19%, consisting of a 5% base level plus 14% from the dynamic factor.

Investment Allocation:

100% US Diversified Equity with a mutual fund expense ratio of 1.00%. Revenue sharing is 0.25%.

Expenses: \$85 per policy with inflation of 3% beginning in the second projection year plus 0.05% of account value.

Other Financial Assumptions:

Statutory reserve is assumed to be Cash Surrender Value.

Discount Rate for PV of Worst Surplus: 5.77% before-tax or 3.75% after-tax.

Federal Income Tax: 35%

Cell Characteristics: All male; attained age and duration depends on cell. Average size (depends on cell) is approximately \$50,000.

Scenarios: 1,000 scenarios were selected using the picking tool developed by the C3P2 Working Group. The corresponding 7 Year US Treasury Rate to each scenario / duration was used in calculating the Cost of Annuitization.