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UPDATE ON UNIVERSAL LIFE RESERVES AND NON-FORFEITURE VALUES

Moderator: DOUGLAS C. DOLL
Panelists: JAMES W. LAMSON
PHILIP K. POLKINGHORN
Recorder: PHILIP K. POLKINGHORN

- Discussion of emerging proposals for revision of the NAIC Model Regulation to address the following areas:
  - -- Current status of state requirements
  - -- Valuation concerns
  - -- Non-forfeiture concerns
  - -- Disclosure concerns
  - -- Implementation

MR. JAMES W. LAMSON: My presentation will cover the valuation aspects of the NAIC Universal Life (UL) Model Regulation. The specific topics are: (1) a brief history and current status of the regulation, its adoption by the states, and attempts to modify the reserve definition; (2) the NAIC definition of Commissioner's Reserve Valuation Method (CRVM) reserves; (3) some of the practical considerations in performing a valuation, including tax reserves and approximate relationships between fund values and reserves; and (4) graphs of numerical results which may be obtained.

BRIEF HISTORY AND STATE ADOPTION

When UL was first created, attention was given to the open nature of the product without a lot of attention given to the reserve calculations. The original policy form filings generally contained loose descriptions of the reserve method. Usually the reserve was set equal to the cash value, especially since most policies were front loaded. A description was generally given of a procedure under which the cash value would buy future benefits without any future premiums. Since front loads were less than or equal to the CRVM expense allowance, the cash value was an appropriate reserve.

A bit later, Mike Davlin and Shane Chalke wrote a paper titled, "Universal Life Valuation and Non-Forfeiture: A Generalized Model." This paper described conditions under which the classic UL model, which at the time was used for non-forfeiture compliance demonstrations, was valid. More importantly, this paper provided the theoretical foundation for the UL Model Regulation which was drafted shortly thereafter. There was an NAIC task force which appointed an Industry Advisory Committee. This committee drafted the model regulation and the NAIC adopted it at its December 1983 meeting.

Since its adoption by the NAIC, it has been adopted by the insurance departments of the following states: Arkansas, Kansas, Louisiana, Mississippi, Missouri, Nebraska, New Mexico, North Dakota, and Oklahoma. Pennsylvania has

adopted it on an administrative basis. Adoption in other states has been slowed by controversy surrounding the non-forfeiture and valuation aspects. In addition to those states, there have been partial adoptions in two more states. Washington adopted the model regulation, but it only applies to fixed premium UL. Wyoming adopted the regulation but excluded all of the valuation and non-forfeiture aspects.

In December 1987, there was a footnote change made to the model regulation clarifying that the automatic workings of a policy were to be considered structural changes. An example is Excess Interest Whole Life, where the level death benefit is not guaranteed for the entire life of the policy, but that guarantee is extended to later years following issue. However, if the benefits are funded by the insurer's declared guarantees of interest, mortality, and expenses over the guarantees contained in the policy as the date of issue, then the present value of those benefits is excluded from the calculation of the net level premium.

There is an American Academy of Actuaries Task Force headed by Doug Doll. At the request of the Actuarial Task Force of the NAIC, it has worked on a simplification for the UL reserve calculation. They described three methods to the Actuarial Task Force in June 1987.

The first is the factor approximation approach, which has been called the Guaranteed Maturity Premium (GMP) Method. This method recognizes for policies where "r" (as defined in the model regulation) is less than one that if there aren't any short-term guarantees of cost of insurance (COI) or interest, then the reserve is a fraction of an endowment at 95 reserve (if the contract matures at 95). If the "r" value is greater than one, then the insurer is to put up the traditional endowment at 95 reserve and add in the excess of the fund value over the Guaranteed Maturity Fund (GMF).

The second method described was the Policy Value Method. Under this method, the reserve is equal to the fund value minus a fraction of the CRVM expense allowance. That fraction is found by taking the policy fund value and dividing by the net level reserve calculated on a traditional basis, but not letting that ratio be greater than one. This method involves no projections at the time of valuation, but is not a prospective reserve calculation method.

Finally, the Paid-up Method was described. Under that method, an insurer needs to apply the fund value to "buy" as much future benefits as the fund can purchase, and then subtract off the full expense allowance. There was also a proposal for modifying the expense allowance for under-funded policies. This option has the advantage that the insurer's current guarantees (guarantees of interest and COI in effect at the time of valuation) would be reflected in the reserve calculation.

These proposals were described to the Actuarial Task Force in June 1987. At their October meeting, they took no action and have evidently decided to take no action whatsoever on these proposals in favor of developing their own proposals. John Montgomery of the California Department has already taken action. His proposal, which should be exposed for comment in the next few months, uses the UL Model Regulation Method for calculating the reserve, but with several modifications. One is that the valuation interest rate cannot exceed the guaranteed interest rate under the contract. If the policy guaranteed interest is 4%, and the valuation rate is 5.5%, it would be necessary to reduce it to 4%. In addition, there is a provision for reserves for future cash values. It is similar to a

Commissioner's Annuity Reserve Valuation Method (CARVM) calculation involving the greatest of the present values of future cash values. Finally, his proposal includes a simplified reserve method under which a reserve equal to the mean of the fund value and the cash value could be held.

DEFINITION OF CRVM RESERVES IN MODEL REGULATION

The NAIC definition of CRVM reserves is a prospective calculation embodying the long-standing valuation principle that the amount set aside today, together with future premiums and assumed investment income, should be enough to provide the future benefits. In so doing, it recognizes the value of short-term guarantees an insurer may have on the valuation date.

The reserve definition from the model regulation involves the calculation of a net level reserve used to calculate the CRVM reserve (See Table 1). It can be paraphrased as: The quantity A represents the present value of future benefits at the valuation date. B represents the present value of future premiums at the valuation date. The net level premium (the first part quantity B) is computed at issue based on the guarantees that exist at that time. On the valuation date, a projection is performed to define a set of death benefits to use in the calculation of the amount A.

The UL Model Regulation then defines the CRVM reserve as equal to the net level reserve less C and less D. C is the unamortized expense allowance under the CRVM expense allowance definition. D includes amounts similar to C that arise because of so-called structural changes in policies, like increases in specified amount.

Doing a reserve valuation is a two-phase process. The calculations don't all have to be done at separate times of course, but the focus of the calculations is different. At issue, one needs to calculate the GMP. It is equal to the gross premium for Excess Interest Whole Life products, but for UL products it involves solving for the gross premium that will mature the policy based on the guarantees at issue.

The above calculation involves: (a) premium loading; (b) expense charges; (c) COI for the base policy and riders; (d) guaranteed interest; (e) use of the death benefit formula from the policy; (f) the policy value accumulation formula; (g) projection of the endowment at maturity; (h) consideration of increases and decreases in specified amount and their timing; and (i) death benefit option changes from A to B. One can see that it is a complicated calculation.

At issue, one needs to determine the guarantees that existed at that time. There are the policy form guarantees and short-term declarations, such as guaranteeing 9% for the first policy year. All these guarantees need to be included in the calculation as well as other guarantees that might affect the future benefits.

One must then calculate an "at issue" valuation premium. The GMP calculation generates GMF values and they are used along with the death benefit formula from the policy form to generate the stream of death benefits used to compute the net level premium.

For fixed premium products, the valuation premium is based on the benefits guaranteed at issue. One uses the normal valuation basis interest and mortality and a conventional type of calculation to determine the net premium. One could

TABLE 1

"Reserves by the Net Level Reserve Method shall be equal to $((A)-(B))\cdot r$," where:

$$A = \frac{1}{D_{x+t-1}} \left(\sum_{s=12t+1}^{m} DB_s^V \cdot C_{x+\frac{s-1}{12}} + FV_m^V \cdot D_y \right)$$

$$B = \frac{\left(\sum_{s=1}^{m} DB_s^I \cdot C_{x+\frac{s-1}{12}} + FV_m^I \cdot D_y\right)}{D_x} \cdot \frac{\ddot{a}_{x+t:\overline{y-x-t}|}}{\ddot{a}_{x:\overline{y-x}|}}$$

- x is the issue age
- y is the maturity age
- t is the duration of the policy
- m is the benefit period of the policy in months.
- FV_m is the fund value at maturity (FV_m^I is at issue, FV_m^V is at valuation)
- DB_s is the death benefit in the s^{th} policy month assuming future GMPs are paid and taking into account all guarantees contained in the policy or declared by the insurer (appropriate for DB_s^I or DB_s^V)
- $r = \frac{PolicyValue}{GMF} \not> 1$ for flexible premium policies
- $r = 1$ for fixed premium policies

use monthly qx's to coincide with the monthly calculations inside the policy value calculation and also to recognize that death benefits generally are defined on a monthly basis. Approximations could be used, one of which is to use annual death benefits computed on an average basis.

At the time of valuation, one must to do a projection of future benefits. Start the projection with the fund value or GMF, if larger, and compute the "r" ratio. Use the fund value formula to project the fund to maturity, then calculate future endowment benefits and intermediate death benefits. For example, on an Option A (level death benefit) policy, one must take account of the death benefit corridors that may be "hit" along the way.

The guarantees to use at the time of valuation are those contained in the policy form, plus any unexpired additional guarantees. For example, if 9% was guaranteed for the current policy year, then valuations performed during that year need to take into account the unexpired portion of the guarantee. Finally, use the death benefits and the endowment from that projection to calculate the present value of future benefits. Use conventional formulas, valuation interest and mortality.

There is also a calculation for the CRVM reserve that incorporates the minimum reserve concept, in other words, the deficiency reserve. So, as long as Beta in the CRVM calculation is less than the GMP, then the regular CRVM reserve can be computed. If Beta is larger than the GMP (which can happen pretty easily), one must do the present value of future benefits calculations, using the minimum basis mortality and interest, and substitute the GMP for Beta, to see if additional reserves are needed.

Finally, rider reserves need to be computed. The Model Regulation defines the reserve using the phraseology "reserve for basic policy and any benefits and/or riders," so we need to take riders into account. Rider COI needs to be included in the calculation of the GMP, GMF, and in valuation projections. In addition, there may be a small reserve for any unearned COI for those policies which have COI charged on an attained age basis.

Secondly, the COI for "issue age" riders (level COI riders) can generate an additional reserve. The benefits for these riders are apparently included in the future benefits calculation described in the UL Model Regulation. The net premiums would be included in the present value future premium calculation. One can easily show that one can simply pull the reserves for these riders out and apply normal rider reserve factors instead.

Finally, one needs to account for the deferred net premium asset to recognize that the portion of the full year net premium on the last anniversary has not been paid. Its size varies according to the assumed GMP payment frequency. It is higher for monthly GMPs than for annual. This is appropriate, since if we start with the valuation date fund value and compute monthly GMPs, we would have a few extra months of GMPs in our projection than we would on an annual basis. On an annual basis, we would not put any more GMPs in until the next policy anniversary. I have recommended several times to offset the deferred net premium asset against the otherwise calculated reserve. Otherwise, some people might object to the idea of a deferred premium asset on a flexible premium product.

PRACTICAL CONSIDERATIONS

Let us move to some of the practical considerations of performing these valuations. The GMP does not change from one valuation to the next unless there have been policy changes, so the GMP and the valuation net premiums could be retained and not be recomputed for each valuation. If there are no per policy expense charges in the product design, then the GMP is proportional for all policy sizes. One could then calculate a table of GMPs on a per thousand basis. If the GMP is retained in the valuation system, one must also retain the last value of the GMF to derive the next value of the GMF. Again, if there are no per policy expense charge elements, then the GMF can be precalculated and done during a valuation as a factor look-up. These are some of the things that could simplify the process.

With regard to tax reserve calculations, one should recognize that the guaranteed interest rate used in the projection of future benefits must be limited to an amount not greater than the Prevailing State Assumed Rate (or the Applicable Federal Interest Rate as modified in the Revenue Act of 1987). Also, if there has been any "blow-up" of statutory reserves (defined later), the increase in reserves can be "washed out" by the higher tax reserve interest rate. This could result in "phantom income" in the tax return that doesn't appear in the Annual Statement because of the reserve increases that would go through the Statutory Statement and wouldn't go through the tax return. Finally, the statutory reserves must be available for the tax reserve comparison. One must either do a dual valuation that does statutory and tax at the same time or else retain the statutory values for the tax valuation. One should also calculate rider reserves for the tax comparison, because UL riders are not "qualified supplemental benefits" under the tax law. As a result, they need to be included in the comparison between cash values and statutory reserves. The tax reserve may often equal the cash value. Partly, this is because the tax reserve interest rate is larger than the statutory reserve rate. This "drives down" the tax reserve to the point where the cash value is greater. On front-loaded products it is quite common to have tax reserves equal to the cash value.

Some approximate relationships that can be developed will be discussed further. The early UL designs generally had interest at a rate equal to the valuation interest rate and guaranteed COI was equal to the valuation mortality rates. Under these conditions, there are reserve relationships that can be developed. For example, the net level reserve will usually be approximately equal to the fund value. The CRVM reserve would then be approximately equal to the fund value less the CRVM expense allowance (as modified by the r ratio).

UNEXPECTED RESULTS AND APPROXIMATE RELATIONSHIPS

Let us get into some of the unexpected results that come about under UL valuations. One should be aware of the fact that the way UL products are constructed, fund values don't get used to purchase anything -- they just "lay around" and accumulate at interest. They are finally used either to buy additional death benefits when the death benefit corridor forces the death benefit to increase or they result in a larger endowment at maturity. This has a large effect on the calculation of the reserves.

Consider that there are really two parts to the fund value, at least for a policy that is "over funded" (i.e., has a fund value greater than the GMF). The first part is equal to the GMF. The second part we might call the excess fund, and it is equal to the excess of the fund value over the GMF. The way I like to think about this is that the GMF buys term life insurance to the maturity date,

and the excess fund buys either a pure endowment at maturity or "old age benefits" that result from the application of the death benefit corridor. In other words, the second part of the fund simply accumulates interest and is finally used in the later durations of the policy to purchase additional benefits.

The relationship of guaranteed COI and valuation mortality is critical in predicting UL reserves. There are three possible relationships for a given rate at a given age. The guaranteed COI and valuation mortality rates can either be: (1) approximately equal; (2) guaranteed COI is greater than the valuation qx's (very common on single premium life policies); or (3) guaranteed COI is less than valuation mortality (this almost never happens). The mortality relationship is most important for heavily funded policies in which the fund value is greater than the GMF.

Under the conditions in which guaranteed COI is approximately the same as valuation mortality, reserves behave normally. The "insurance reserve," that is, the reserve for the benefits purchased prior to maturity (or prior to old age benefits) is approximately equal to "r" times the traditional product reserve. The reserve corresponding to excess funds will be referred to as an "endowment reserve." As long as the COI is approximately the same as valuation mortality, the endowment reserve will be approximately equal to the excess of the fund value over the GMF. Table 2 illustrates some relationships between these values.

If expense charges are level, the net level reserve is approximately equal to the fund value, and the CRVM reserve is approximately equal to the fund value less "r" times the CRVM expense allowance (but never less than the cash value). If we have unlevel expense charges, the situation is more complicated.

When guaranteed COI is greater than valuation mortality, the "insurance reserve" is still predictable. Conservative guarantees yield lower reserves, which is what one would expect out of a valuation standard. If an insurer has, for example, COI guarantees of 150% of valuation mortality, then one might expect reserves to be lower. This is partly because the GMF then becomes relatively higher subject to the slope of the COI rates. This results in "r" becoming smaller. The reserve to which "r" is applied for this portion of the benefits is the same as under the conditions described earlier in which we had the guaranteed COI coinciding with valuation mortality.

The "endowment reserve" is valued the way one would normally expect. However, the endowment reserve can be higher than the excess fund value, resulting in a reserve "blow-up." As the fund value increases, this effect causes the endowment reserve increase to overtake the amount by which the insurance reserve is less than the GMF. As fund values increase, the "blow-up" in the endowment reserve overtakes the reduction in the insurance reserve, resulting in larger overall reserves!

The reverse situation holds true. That is, if guaranteed COI is less than the valuation qx's then the relationship of the insurance reserve to the GMF is still predictable. "r" is larger, and the insurance reserve gets bigger, but the endowment reserve can actually shrink.

Let us consider some UL policies with cash value roll-overs or premiums payments greater than the GMP. For illustration purposes, I have created two sample products -- one which represents a "normal" product in today's market,

TABLE 2

CONCEPTUAL APPROXIMATIONS TO MODEL REG RESERVES

Guaranteed Interest And COI Approximately Equal To Valuation Interest and Mortality

Pattern of Expense Charges	Approximate Net Level Reserve	Approximate CRVM Reserve
Level	FV	$FV - r \cdot {}_tEA^{CRVM} \not< CV$
${}_1EC_x > {}_REC_x$	$FV + {}_tUAEC_x$	CV, if $SC + r \cdot {}_tUAEC_x < r \cdot {}_tEA^{CRVM}$ Otherwise, $FV + r\left[{}_tUAEC_x - {}_tEA^{CRVM}\right]$

and the other which is identical, except that the guaranteed COI rates are larger. The products are summarized in Table 3, along with the two premium payment patterns -- one for level premiums, and the other involving a "dump-in" of premium at issue.

The intended result of having a cash value dump-in is to obtain projected fund values that are greater than the GMF values.

The valuation interest is 4%, which is the same as the guaranteed interest rate. Valuation mortality is 1980 Commissioners Standard Ordinary (CSO) male, age last birthday and coincides with the guaranteed COI rates.

The difference between the Normal product and the High Guaranteed COI product is just what the name implies. The first has guaranteed COI rates of 100% of the 1980 CSO table; the second has 150% guarantees. In all other respects, the products are identical.

We used our valuation system to compute reserves for $100,000 policies on these two products on both the level premium basis and the dump-in basis. The level premium fund values on both products are less than their corresponding GMFs, so "r" is less than one for both products. As can be seen in Graph 1, the product with the 150% guarantee has a GMF value greater than the GMF of the 100% product so the "r" on the 150% guarantee is less than "r" on the 100% guarantee basis.

The reserve for policies with no dump-in under both product designs is equal to the corresponding "r" times the traditional endowment at 95 reserve (same for both products). The scale on the left-hand side of Graph 1 illustrates the amount of the guaranteed maturity fund and the scale on the bottom illustrates policy years.

Graph 2 is a three-dimensional graph showing the same results as Graph 1, but for all issue ages tested (age 0 to 70). The scale on the lower left illustrates policy years 1 to 30. The scale on the lower right illustrates issue ages 5 to 70. What is illustrated is the relationship between the GMF for the two products described above. The ratio at most ages is about 115%. In other words, the 50% additional COI rates produce about a 15% increase in the GMF values except at issue age 0.

On Graph 3, I have calculated the ratio of the fund value to the GMF for the High Guaranteed COI product with a dump-in. Note that the policy years scale is backwards. This was done to improve the visibility of the three-dimensional graph. In the first policy year for all issue ages, and at all durations for the older issue ages, the ratio of the fund value to the GMF is quite large. The same is true for the Normal plan, except the ratios are even higher.

Graph 4 contains the ratio of the resulting CRVM reserves to the fund values for the Normal product with a dump-in. The ratio scale at the back wall of the graph ranges from .84 to 1.04. The reserve to fund value ratio at early durations starts out near the 80% level. The ratio reserve then increases in a normal fashion. The reserve is equal to the fund value after the surrender charges wear off. This is not too surprising, since the guaranteed COI is equal to the valuation mortality and guaranteed interest coincides with the valuation q_x's.

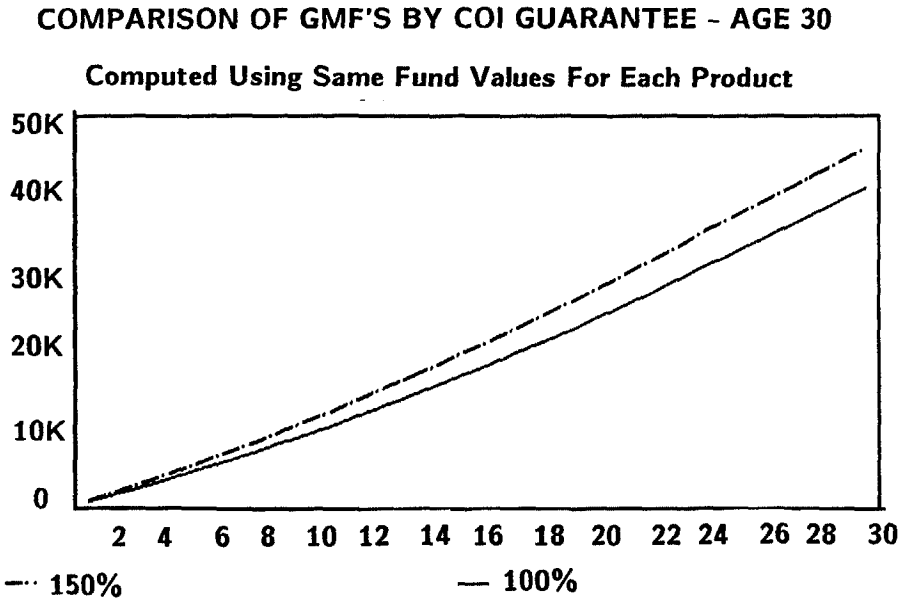
TABLE 3

Product Characteristic	Product			
	"Normal"		High Guaranteed COI	
	No Dump-In	With Dump-In	No Dump-In	With Dump-In
Gross Premiums:	Req'd To Mature*	Same	Req'd To Mature*	Same
Dump-In:	None	5× Level	None	5× Level
Premium Loads:	5% All Years	Same	5% All Years	Same
Guaranteed Interest:	4%	Same	4%	Same
Guaranteed COI:	'80 CSO Male, ALB	Same	150% of '80 CSO	Same
Current COI:	Realistic **	Same	Realistic **	Same
Monthly Exp. Charge:	$2.50 Per Policy	Same	$2.50 Per Policy	Same
Projected Interest:	9%	Same	9%	Same
Death Benefit Corridor:	DEFRA	Same	DEFRA	Same
Surr. Chgs. (10 Yrs.):	100%, 90%,..., 10%	Same	100%, 90%,..., 10%	Same
Maturity:	Age 95	Same	Age 95	Same
Valuation Interest:	4%	Same	4%	Same
Valuation Mortality:	'80 CSO Male, ALB	Same	'80 CSO Male, ALB	Same

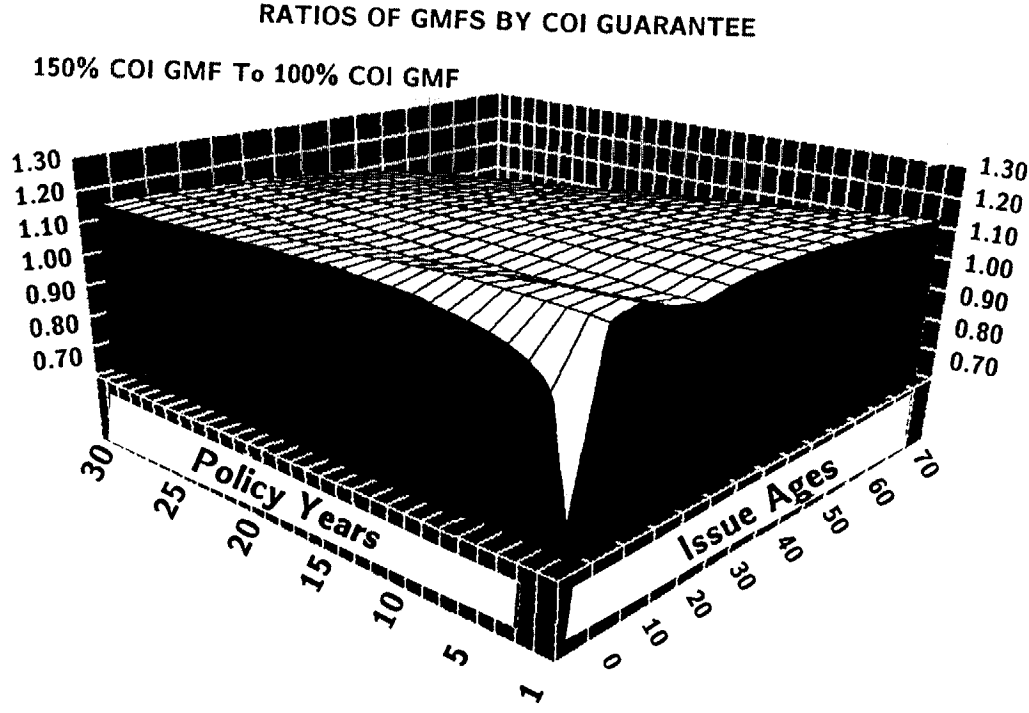
* Level Premium Based on Current Assumptions

** Current COI < 1980 CSO

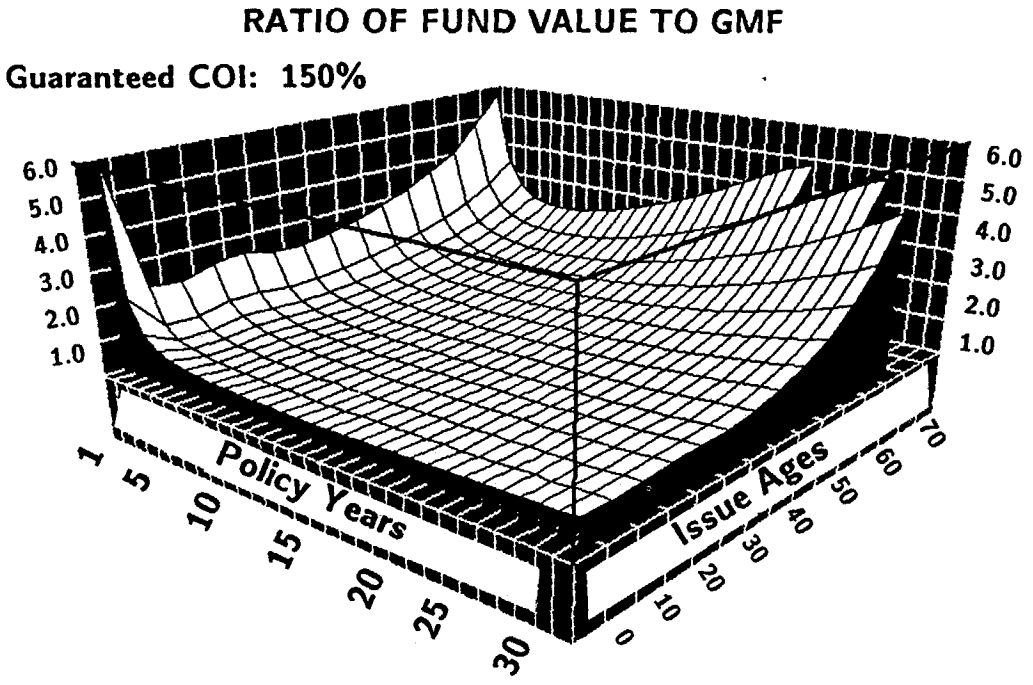
GRAPH 1


COMPARISON OF GMF'S BY COI GUARANTEE - AGE 30
Computed Using Same Fund Values For Each Product
50K
40K
30K
20K
10K
0
2 4 6 8 10 12 14 16 18 20 22 24 26 28 30
150%
100%

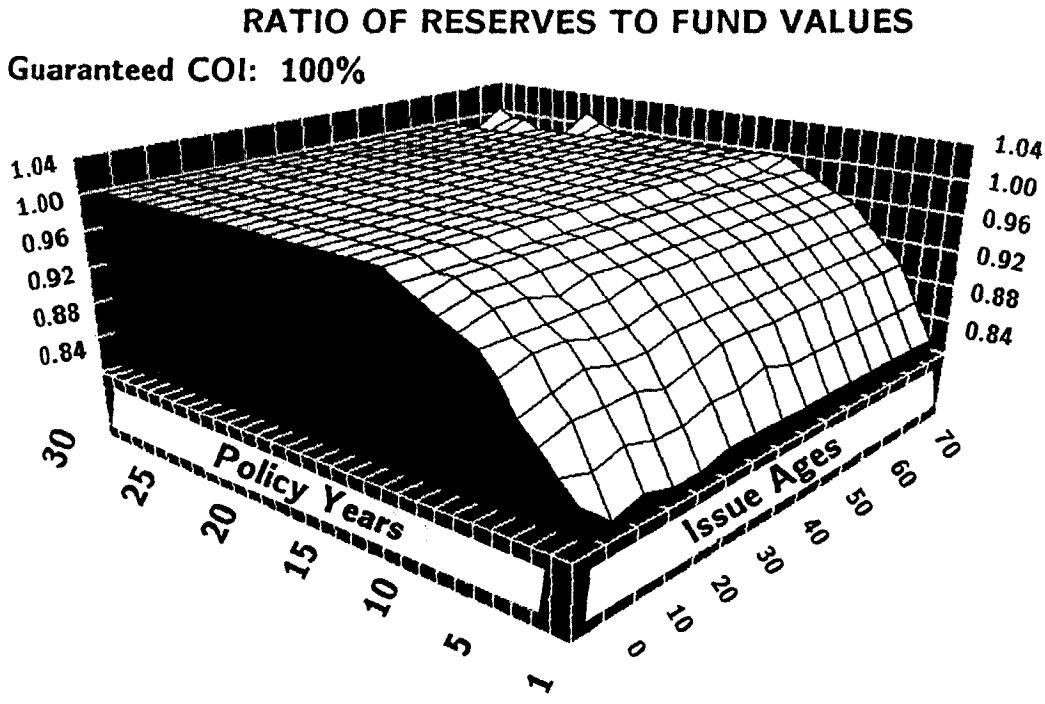
GRAPH 2


RATIOS OF GMFS BY COI GUARANTEE
150% COI GMF To 100% COI GMF
1.30
1.20
1.10
1.00
0.90
0.80
0.70
30
25
20
15
10
5
1
Policy Years
0
10
20
30
40
50
60
70
Issue Ages

GRAPH 3


RATIO OF FUND VALUE TO GMF
Guaranteed COI: 150%
6.0
5.0
4.0
3.0
2.0
1.0
1
5
10
15
20
25
30
Policy Years
0
10
20
30
40
50
60
70
Issue Ages

GRAPH 4


RATIO OF RESERVES TO FUND VALUES
Guaranteed COI: 100%
1.04
1.00
0.96
0.92
0.88
0.84
30
25
20
15
10
5
1
Policy Years
0
10
20
30
40
50
60
70
Issue Ages

Graph 5 illustrates the ratio of reserves to fund values for the High Guaranteed COI product. The policy years scale was reversed again to allow better viewing of the three-dimensional graph. Note that the first year reserve to fund value ratio is greater than 100% at most important issue ages. Thus, one would have surplus strain greater than what would result from holding a reserve equal to the full fund value. This means that, on a product of this type, we have effectively lost the CRVM expense allowance. The effect is most pronounced at the older issue ages. The reserves are larger to fund the pure endowment and old age death benefits, which are on a liberal cost basis (150% of 1980 CSO).

One needs to recognize that, when an insurer sets its guaranteed COI rates, it is simultaneously pricing two different "products" on a guaranteed basis. The first product is the one we usually think about -- the purchase of life insurance death benefits. The other product is an extra pure endowment at maturity or, alternatively, deferred additional death benefits that only come about at the old ages due to the death benefit corridor. This can cause the total reserve to exceed the fund value.

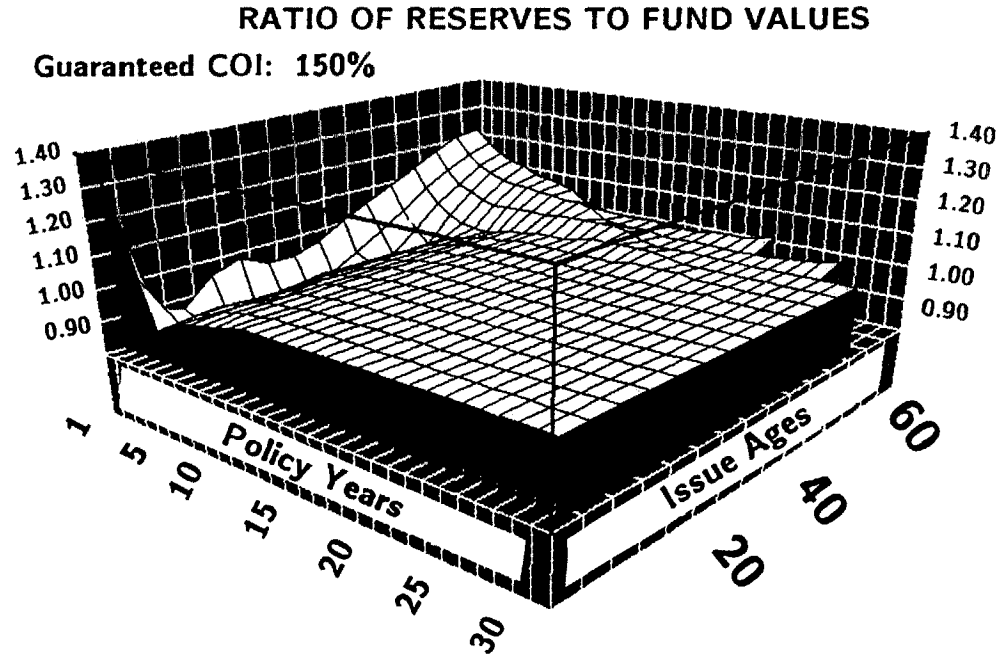
Earlier, I described conceptually dividing up the fund value into its component parts, the GMF and the excess fund value. The reserve for the GMF portion of the fund value is actually a lot less than the GMF. But the reserve for the excess fund value exceeds the excess fund value and actually causes the total reserve to be larger than the fund value.

Graph 6 illustrates the ratio of the reserve increases to the fund value increases for the Normal product with a dump-in. This can be thought of as a measure of the reserve cost as compared to what is received from the policyholder and from investment income. Note that on Graph 6 the three-dimensional graph "floor" is at 84%, so the short bars are not zero, but rather are somewhere near 82%. The ratio of the reserve increases to the fund value increases on this Normal product (where the guaranteed COI coincides with valuation mortality) and illustrates a typical result. The first year reserves are about 80% of the fund value. Remember that these results are based on a policy under which approximately 6 times a whole life premium is paid at issue.

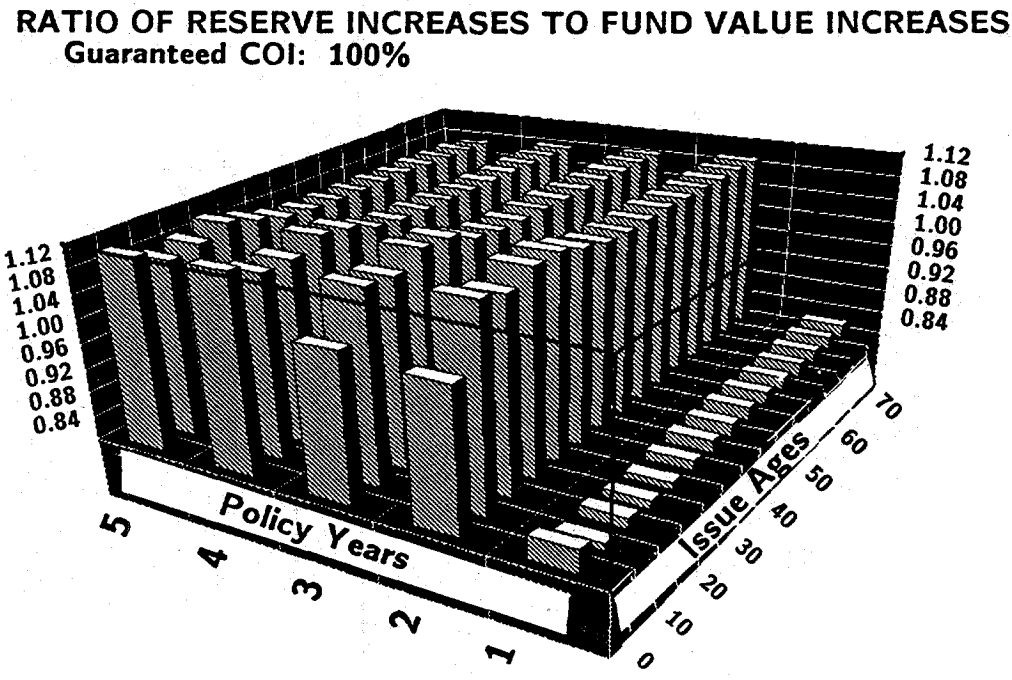
Graph 7 shows the same ratios as Graph 6, except for the Higher Guaranteed COI product. The graph floor is now 20% instead of 84%. Notice the size of the first-year bars. The ratio of the reserve increases to the fund value increases exceeds 100%! The second-year ratio is only about 30% to 50% for the important issue ages. This second-year ratio falls because the GMF growth is much larger than the growth in the fund value. The fund value only has the relatively small gross premium added to it, whereas the GMF has the much larger GMP added to it. The endowment reserve associated with the excess fund value shrinks because the excess fund value shrinks. This type of phenomenon occurring with UL reserves is what makes it very difficult to analyze the reserve increases in an Annual Statement which includes UL business. I have found over the past few years that it is very dangerous to apply rules of thumb in place of actual valuation calculations for this business.

Graph 8 shows the Exhibit 8 composition of the reserves for the High Guaranteed COI product at issue age 30. The graph shows the break down of the total reserve by Exhibit 8A and 8G. Exhibit 8G contains the reserve for the cash value in excess of the otherwise calculated reserve. The Exhibit 8G reserve never does "go away." There is a similar result at age 45, but the 8G reserve does eventually go down to zero. For age 60, we never do have an 8G reserve.

GRAPH 5

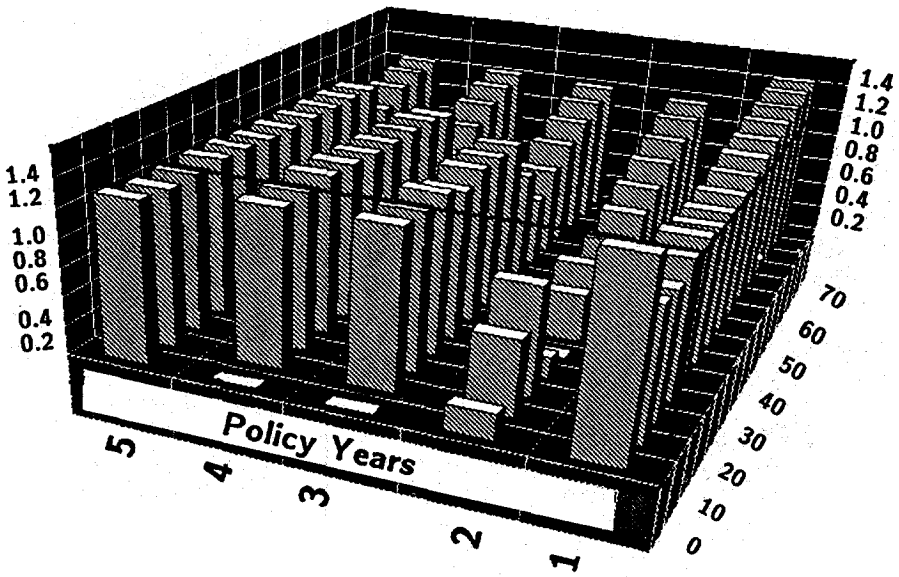

RATIO OF RESERVES TO FUND VALUES
Guaranteed COI: 150%
1.40
1.30
1.20
1.10
1.00
0.90
1
5
10
15
20
25
30
Policy Years
Issue Ages
20
40
60

GRAPH 6


RATIO OF RESERVE INCREASES TO FUND VALUE INCREASES
Guaranteed COI: 100%
1.12
1.08
1.04
1.00
0.96
0.92
0.88
0.84
Policy Years
5
4
3
2
1
Issue Ages
0
10
20
30
40
50
60
70

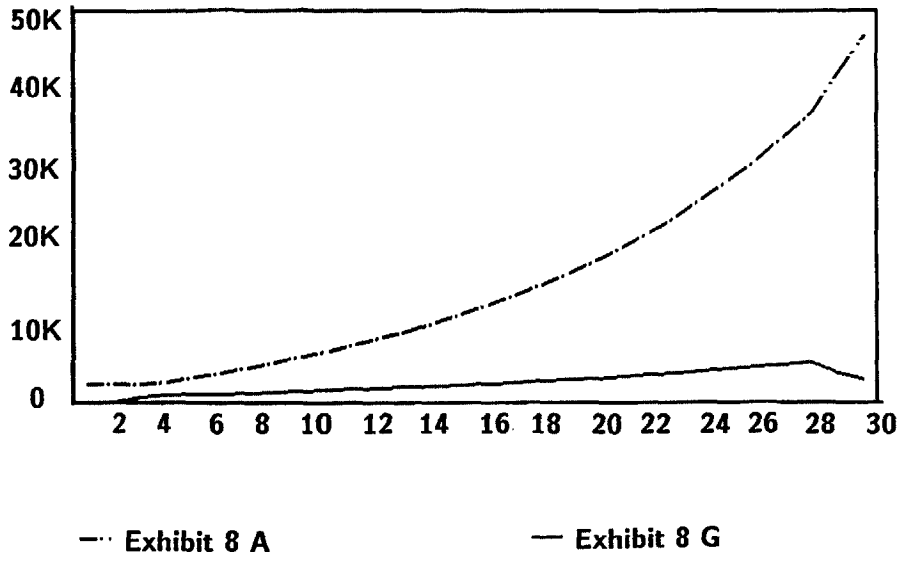
GRAPH 7

RATIO OF RESERVE INCREASES TO FUND VALUE INCREASES
Guaranteed COI: 150%



GRAPH 8

EXHIBIT 8 COMPOSITION OF TOTAL RESERVE - AGE 30
Guaranteed COI: 150%



Graph 9 shows the portion of the total reserve for the High Guaranteed COI product with a dump-in that you would place in Exhibit 8A. All issue ages are represented. The scale on the lower left is policy years and on the right is issue ages. The slope of this graph represents the effect of over-funding with the dump-in. At the older issue ages, there is a tremendous increase in this reserve over time.

Graph 10 illustrates the 8G reserve. I had to rotate this graph quite a bit to make the trough at ages over 30 be visible. The scale goes from $1000 to $6000 on the 8G reserves as compared with the scale in Graph 9 where it went to $450,000. There is a large drop in the 8G reserve at the older ages.

Let's turn our attention to some single premium life results. Table 4 contains the key product characteristics for two single premium whole life (SPWL) products. The only difference between them is the guaranteed interest rate. With both products, there are two key assumptions made. The first is that a zero COI rate was guaranteed for the first five policy years. The second is that at policy years six and later, the guarantee was 150% of valuation mortality. Something like this is very common in single premium life.

Graph 11 shows the ratio of the reserve to the fund value for SPWL1. One can observe significantly increased reserves at the older issue ages due to the five-year zero COI guarantee. The policy year scale is in the front of the graph, with issue ages on the right side. Initially, the reserve for the excess fund value is zero, since the GMF is equal to the gross premium, and both are equal to the Guideline Single Premium. As the fund value grows due to interest credits, there is a reserve blow-up that occurs similar to that illustrated earlier. In the valuation-time projection of future benefit, excess interest turns into a combination of pure endowment and additional older age corridor death benefits. The reserve for the excess fund value then becomes greater than the excess itself.

Graph 12 shows the ratio of the reserve increases to fund value increases for the SPWL1 product. This is a particularly interesting graph. The spike which occurs in policy year 8 is because this plan had a surrender charge graded from 10% down to 4% and then dropped off in a cliff fashion. In the 8th year, there is a huge reserve increase as represented by the spike. However, there are some other reserve increases occurring, particularly at the older ages, in policy years 5, 6, and 7 that result from the blow-up due to the 150% guarantee of COI. This could result in an earnings disruption at a time when one would think earnings would be good. In policy years 5, 6, and 7, one would be past the period of zero COI guarantee, but would still be incurring relatively large reserve increases.

Graph 13 pertains to the SPWL2 product. The SPWL2 product is just like SPWL1 except that we have decreased the guaranteed interest rate from 6% to 4% in an effort to reduce reserves. The ratios of reserves to fund values are now quite normal looking. In the early policy years, the ratio never exceeds one. So, there is no reserve blow-up, but we have done it by creating a 2% differential between the guaranteed interest rate and the valuation interest rate.

Graph 14 shows the ratio of reserve increases to fund value increases for product SPWL2. In the early policy years, there is a normal progression of reserve increases compared to fund value increases. In policy year 8, there is a huge spike caused by the surrender charge dropping off.

GRAPH 9

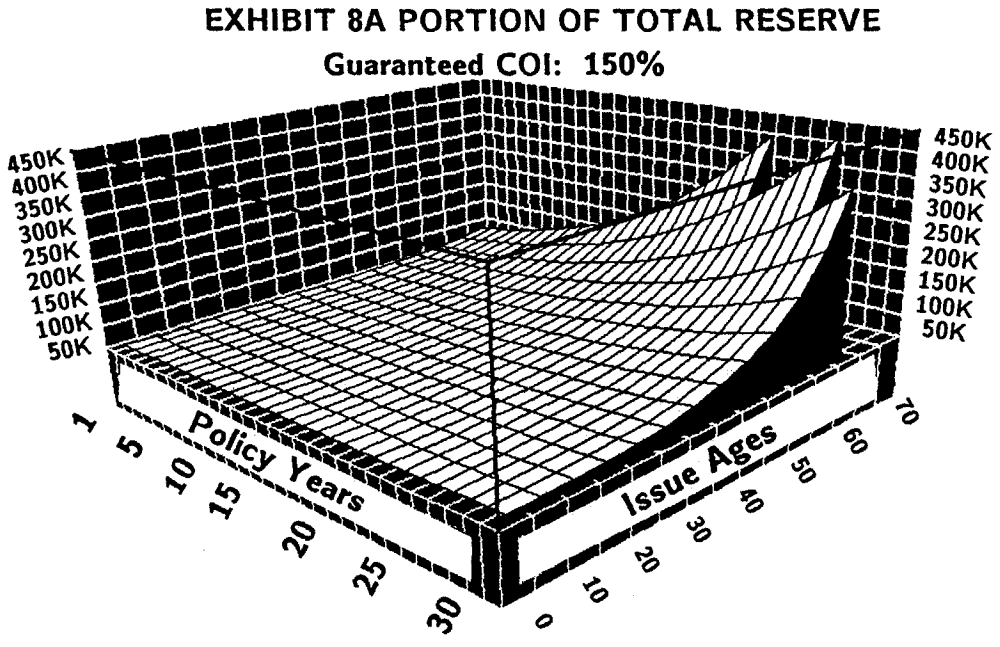


EXHIBIT 8A PORTION OF TOTAL RESERVE
Guaranteed COI: 150%
450K
400K
350K
300K
250K
200K
150K
100K
50K
1
5
10
15
20
25
30
Policy Years
0
10
20
30
40
50
60
70
Issue Ages

GRAPH 10

EXHIBIT 8G PORTION OF TOTAL RESERVE
Guaranteed COI: 150%

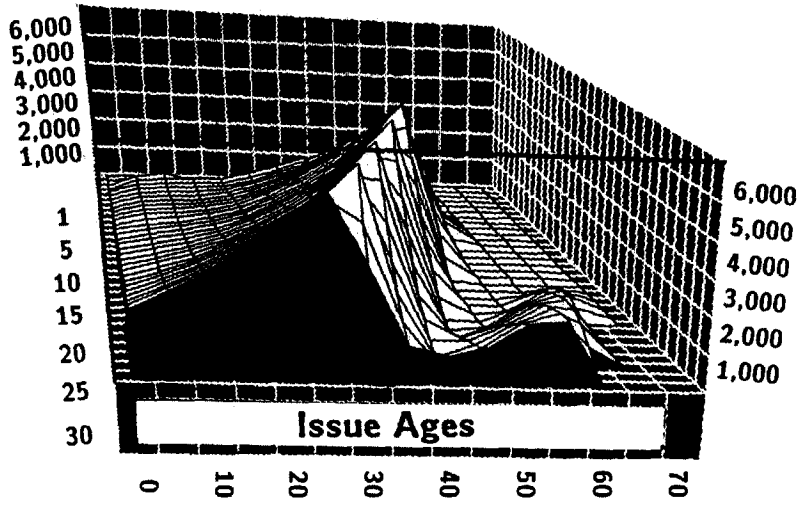
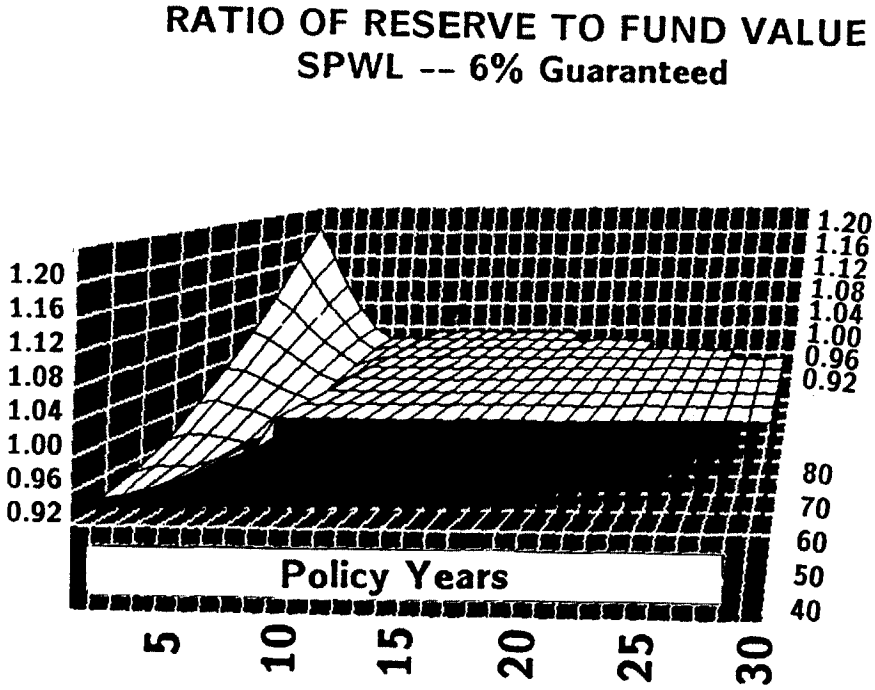


TABLE 4

Characteristics	Product	
	SPWL 1	SPWL 2
Gross Premiums:	Guideline SP Using 6.0%	Guideline SP Using 6.0%
Guaranteed Interest:	6%	4%
Guaranteed COI:	0 for 5 Years, then 150% CSO Male ANB	0 for 5 Years, then 150% CSO Male ANB
Current COI:	0 for 5 Years, then Realistic	0 for 5 Years, then Realistic
Monthly Exp. Charge:	0	0
Projected Interest:	9%	9%
Death Benefit Corridor:	DEFRA	DEFRA
Surr. Chgs. (7 Yrs.):	100%, 90%, ..., 40%	100%, 90%, ..., 40%
Maturity:	Age 97	Age 97
Valuation Interest:	6%	6%
Valuation Mortality:	'80 CSO Male, ANB	'80 CSO Male ANB

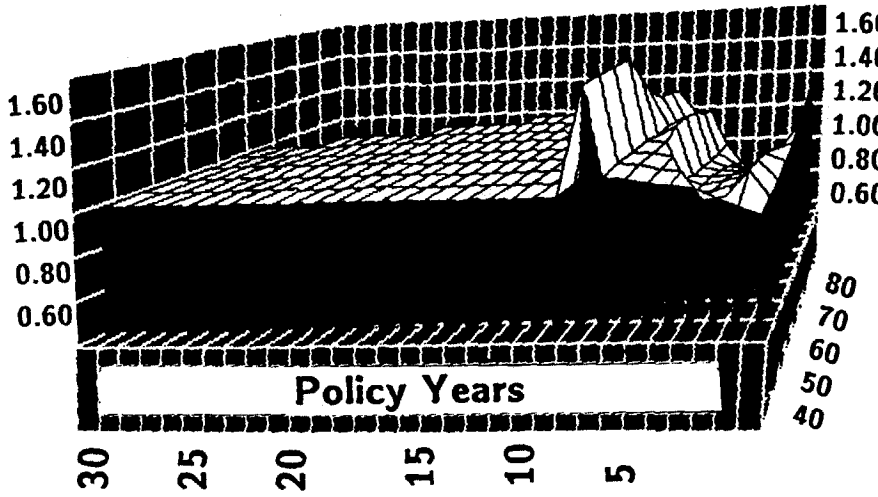
GRAPH 11


RATIO OF RESERVE TO FUND VALUE
SPWL -- 6% Guaranteed
1.20
1.16
1.12
1.08
1.04
1.00
0.96
0.92
1.20
1.16
1.12
1.08
1.04
1.00
0.96
0.92
80
70
60
50
40
Policy Years
5
10
15
20
25
30

GRAPH 12

RATIO OF RESERVE INCREASES TO FUND VALUE INCREASES

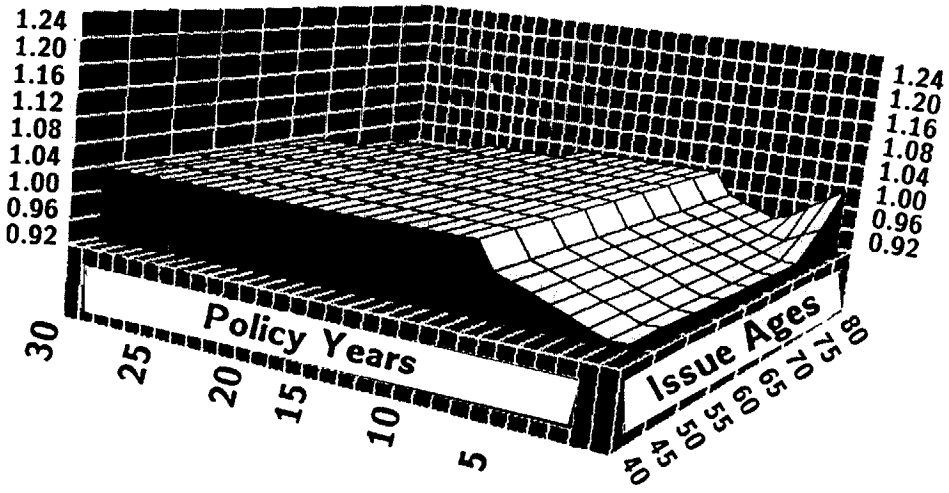
SPWL -- 6% Guaranteed Interest



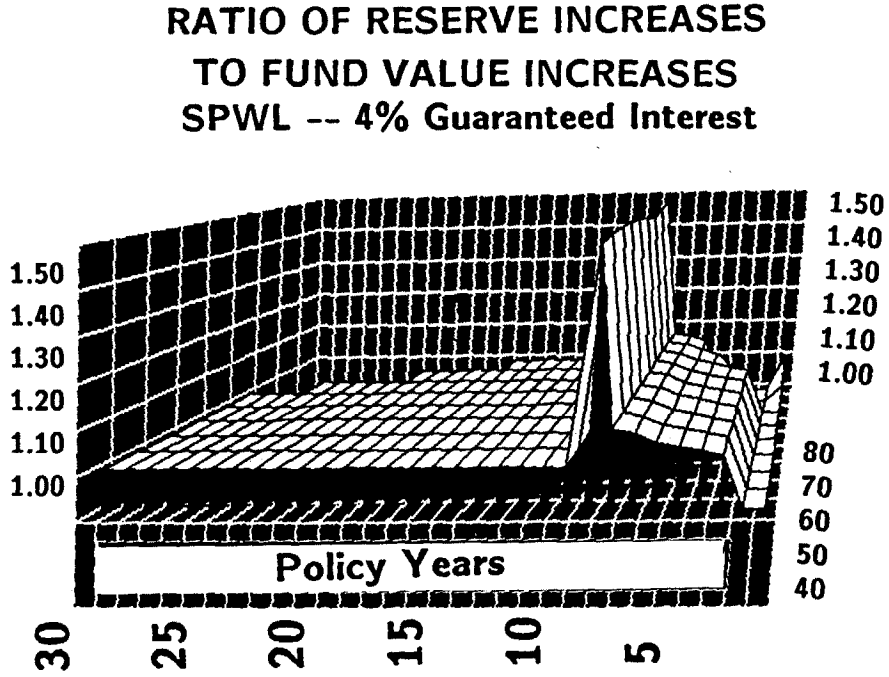
GRAPH 13

RATIO OF RESERVE TO FUND VALUE

SPWL -- 4% Guaranteed



GRAPH 14


RATIO OF RESERVE INCREASES
TO FUND VALUE INCREASES
SPWL -- 4% Guaranteed Interest
1.50
1.40
1.30
1.20
1.10
1.00
1.50
1.40
1.30
1.20
1.10
1.00
80
70
60
50
40
Policy Years
30
25
20
15
10
5

In conclusion, you can see that UL reserves are complicated and not to be taken lightly in terms of what it takes to do the calculations. The old rules of thumb we all developed early in our careers don't apply very well any longer. Also, in designing our products, we need to remember the blow-up or shrinkage that can result in the reserve corresponding to excess fund value (the excess of fund value over GMF). And remember that when one sets the guaranteed COI rates, one is simultaneously pricing the guaranteed cost of life insurance and the pure endowment resulting from the projection of excess fund value as well.

MR. BRUCE E. BOOKER: One question you might have is why is there so much discussion of UL and the non-forfeiture rules now? The product has been around for 10 years; what is the problem? As I see it, companies, state regulators, agents, and the buying public are all concerned with the credibility of the process. What is a company selling? How should the states regulate what is going on?

I think the company, as always, is selling promises. It is saying that, if you give us your money today, we will pay your family tomorrow. The emphasis on products in the past, prior to about 1975 anyway, was on the guaranteed nature of the promise. Premiums and benefits were fixed. If experience turned out to be good and a policy was participating, the company might share that good experience with the policyowner. A non-participating policy could generally guarantee something reasonably close to the current experience. Part of the reason that this was true was that current and expected experience at that time was not tremendously better than that which prudence and valuation laws would allow as long-term guarantees.

For the past dozen or so years, current and expected experience has been much better than the companies were willing or able to guarantee for long periods of time. The reaction of companies to this situation varied. Many participating policies kept the same premium but began illustrating the use of dividends to vanish the premium in just a few years. Most non-participating policies and some participating policies began the use of current premiums or benefits based on current or expected experience and with a less favorable scale as a long-term guarantee. The promise has changed from "I will guarantee that the premium you see will provide the benefits you see, and maybe share future good times with you" to a promise of "I will share the good experience I expect with you now, but if it doesn't happen you will have to pay me more than you may have expected to."

What UL does, among other things, is to let the policyowner or maybe the agent pick the point on the line between these two promises -- pick the point that best fits the situation that the agent or the policyowner is in. He can have a high premium policy with lots of dividends if experience does remain good or he can pay a very low premium but have a big risk of increasing the premium if experience does not turn out so well. One thing this ability does, it opens up the traditional 3-factor dividend formula, the black box, so that some of the workings are exposed. That is the good side, the opening up of the black box.

On perhaps the bad side, the potential buyer is now being subjected to sales illustrations from companies that look identical to him. Some of these have 7% current scale interest rates, some have 13%, some are front loaded, some are back loaded. He sees all kinds of different promises. How can he assess the credibility of these proposals? What promises are actually being made? How much risk is he taking and how much is he transferring to the insurer? Does

he know what things can change and what things can't? How much should we tell him? How much does he want to know, for that matter?

One way of looking at what is going on in the discussion of UL non-forfeiture rules is to look at it as a debate on how many of the workings should be exposed, how they should be described, what freedoms and constraints companies should have in designing the workings of a policy, and how companies can change these workings after the policy is issued.

The industry regulators and state legislatures are making attempts in several fronts to address all these questions. The first one that struck close to home for me this year (because I had to sign it) was the exclusion in the 1987 annual statement of a requirement that companies with policies having any non-guaranteed elements complete an interrogatory describing their methods of determining and redetermining non-guaranteed elements. Included was a statement to be signed by a qualified actuary that the proposals currently authorized by the companies could be supported by currently anticipated experience.

The second front is on disclosure. Many states and the American Council of Life Insurance (ACLI) have examined proposals to strengthen cost disclosure requirements. These proposals are meant to ensure that the guarantees and the non-guaranteed elements are both properly disclosed at the point of sale. Among these proposals were: (a) a yield index, (b) requirements that interest rates and life insurance policies not be advertised without reference to the fact that there are charges deducted from premiums and from account values in interest earnings, (c) a prohibition or perhaps a limitation on illustrations of policy performance that are more favorable than whatever the insurer's current scale is, and (d) a requirement that all non-guaranteed elements in a policy be accurately described in all advertisements. One forum for discussion of these proposals is the ACLI Subcommittee on Cost Disclosure, which meets quarterly at the ACLI in Washington, D.C.

Several state insurance departments have expressed concern that products which comply with UL model regulation may be abusive in that they may have such things as high guaranteed COI charges, low guaranteed interest rates, or high guaranteed expense charges, but illustrate a much more favorable current scale. This line of reasoning would say that abuse would come later from actually charging these unfavorable guarantees and leaving the policyholder with future benefits well below what the policy's cash surrender would purchase on a non-forfeiture basis. The Academy's Universal Life Task Force has been working with the NAIC Actuarial Task Force on these topics.

I will tell you what a couple of big states have been doing and then Phil will tell you about some others. Pennsylvania requires a UL policy to have a guaranteed interest rate of at least 3%. You can not have guaranteed mortality charges that are more than 1980 CSO. New Jersey goes so far as to require that in the filing you specify to the state your pricing assumptions and profit margins, and that you make a promise not to try to recoup past losses or even distribute past gains when you go and adjust these factors. You must meet some discontinuity tests to attempt to rule out overly large tontine benefits.

MR. PHILIP K. POLKINGHORN: Bruce set the stage for how some of the problems developed. I would like to talk a bit about why the states are seeing problems with the model regulations. It was adopted by the NAIC in 1983 but it has a fairly poor track record in terms of adoption as Jim mentioned. When the

NAIC Actuarial Task Force went to the American Academy of Actuaries and asked the Committee on Life Insurance to create a task force to address the problems, the task force said you have to tell us what you are concerned about. What are the problems?

The regulators said they see some really whacky products and find that it is possible to circumvent the expense allowance limitations by manipulating the charges, both the pattern and the level of charges.

To give you an example, the regulators would see products that had guaranteed maximum expense charges that were 50% of premium each and every year, but on a current basis those charges might grade down. The model regulation would average the expense charges in years 2 through 20 to determine how much of the first-year charge was excess expense allowance, and by playing games with the guaranteed versus the current charges they were able to manipulate that amount.

Secondly, they pointed out that the smoothness requirement for guaranteed cash values that is applied to traditional insurance hasn't been applied to UL to any degree, except in one or two states.

The third big concern was that some policyholders might forfeit amounts that had previously been credited. As Bruce mentioned, some people view the UL fund mechanics as an opening of the dividend box, and regulators view the credit of excess interest and the charging of COI rates lower than the guarantee as a dividend. They had a problem, particularly with the fixed premium products in which the policyholder was told that he got, say, 9%, which is 5% more than his guarantee, yet his cash surrender value was not immediately affected. He had nothing to show for the amounts in excess of the guarantee in that year.

Another side issue that came out of these key concerns was the regulation of COI rates. Many of the regulators believe that limiting COI rates to the valuation mortality table is essential to meeting the definition of the standard non-forfeiture law. People from the industry side will argue that no, the valuation mortality table or non-forfeiture mortality table only defines a set of values that are minimum values. You can use other tables if you like, so long as you can prove that your values exceed the minimums.

The second category was a prevention of abuses. The regulators believe that they see many illustration techniques that are abusive, they produce big kick-ups in values at say -- 20th or 10th durations. They would like to have some method in the non-forfeiture law whereby they can police this.

The third area was paid-up values. The regulators believed that many UL contracts effectively violated the concept of offering a paid-up or extended term benefit. Some people argued that the continuation of insurance provision in UL was analogous to extended term. However, as new product designs emerged and companies started putting per policy charges in their contract and other charges that were assessed whether or not premiums were paid in cash, the regulators began to question whether the gross deduction would be greater than a Commissioners Extended Term (CET) deduction. The other argument commonly made by the industry was that paid-up values for traditional polices generally went into effect at the end of the grace period and that for UL by the time you got to the end of the grace period there was no cash value left to apply to a paid-up option.

As we mentioned previously, the regulators were very concerned that fixed premium policies were permitted to have higher surrender charges under the model regulation than flexible premium policies.

What did the American Academy Universal Life Task Force do to respond to this? They developed what they call the GMP test. Essentially, the GMP is a level premium that will endow the contract on a guaranteed basis. The task force recommended that you compare the cash values, given the loading pattern and the charges inherent in the product, using the GMP, and all guaranteed assumptions. If those cash values exceeded the minimum cash values for the similar traditional plan then the product would be deemed to comply with the standard non-forfeiture law. This test is similar to a test that has been required in Texas for a couple of years now.

The Academy Task Force also recommended that there be a smooth cash value test applied to UL. In fact, it was their belief that this test contained in the standard non-forfeiture law already applied to UL products but it was just difficult to implement. They described some shortcut methods that might be used.

Another issue that was questioned by the regulators is should we retain the forfeiture of 12 months' excess interest that is currently contained in the model regulation. The Task Force responded that while it wasn't entirely consistent with some of the other principles, they voted in favor of retaining it. The one key issue that the task force did waffle on a bit was the paid-up option. They were not very specific on whether or not they believed a paid-up option should be required in the policy. They did, however, say that they were very specific that they didn't believe in limiting specific charges and they believed that their GMP test would weed out cases that were abusive and they gave a few key examples.

When the Life Committee reported to the NAIC Actuarial Task Force, the NAIC Actuarial Task Force believed that there was still room for abusive policies to squeak through. So, I would like to take you through some of the current NAIC Actuarial Task Force proposals, and I will discuss briefly some of the Academy Life Committee Universal Life Task Force responses to these on a point by point basis.

The NAIC Actuarial Task Force is currently recommending a minimum guaranteed interest rate of 3%. The Academy Task Force has responded that they're not opposed to this as a practical matter, but in principle they are opposed and don't believe that a minimum guaranteed interest rate is appropriate. Furthermore, since most contracts already contained guaranteed interest rates that are 3% or higher, they are not quite sure what problem it addresses or what it accomplishes. With respect to maximum mortality charges there are people who can get into very heated debates about whether charges should be topped off at the non-forfeiture mortality level or not. But the Task Force has responded that they believe that COI deductions should not be limited. Perhaps a portion of the COI charge should be identified as an expense charge rather than a mortality charge if it gets very high.

The Task Force also believes that manipulative patterns of COI deductions will be weeded out by their GMP test. Examples have been given to the regulators that a whole life product filed in their state today that offered cash values that were equal to 1941 CSO 2.5% values would probably be approved, as long as the

paid-up values were on the more current non-forfeiture basis, but a similar UL product would not be approved.

The current NAIC proposal calls for the GMP test as an add-on to these other features, not as an option "instead of." It also calls for a paid-up option to be available at least once a year to policyholders, so the policyholder can take whatever cash value he or she had and apply it to a net single premium calculated on the non-forfeiture basis to receive a reduced paid-up value. Within the Task Force there were mixed responses to this but generally there is not much objection. I guess the argument that under UL, to be consistent, you would let policyholders go into the paid-up option at the end of the grace period and there really is no cash value there, assumes that a policyholder got to that point on a knowledgeable basis. It was his intention to go to zero, and that he wasn't the analogue to a traditional policyholder who just stopped paying premiums and thought that he would be taken care of.

The current NAIC proposal for some reason calls for expense allowances to be calculated using an interest rate that is the greater of 4% or the guaranteed interest rate in the contract. It is difficult to respond to this since it is not quite clear exactly why that is in there.

The NAIC Actuarial Task Force would like to classify what they refer to as combination policies as fixed premium policies. They were at a bit of a loss for what to do with contracts that said the premiums are fixed and cannot vary for the first 7 years but thereafter the policyholder can vary the amount and timing of premium. They've said that these contracts should be classified as fixed premium contracts and subject to the rules for fixed premium contracts. Furthermore, the Task Force has proposed that fixed premium contracts be subject to having minimum non-forfeiture values be at least as high as they would have developed had they been flexible premium contracts. So you compare the two sets of rules, the current rules for fixed premium contracts and the rules for flexible premium contracts, and you have to hold the higher of the two values. The Task Force has agreed that the smoothness test should apply to UL-type contracts and there are 1 or 2 states that have started to enforce this already. They have also decided to retain the one year conditional excess interest.

Bruce mentioned briefly about what is going on in Pennsylvania and New Jersey. I would like to talk a little about the recent (I believe it was last summer) change in the UL non-forfeiture requirements in the state of New York. You will see that some of the requirements that are being proposed by NAIC right now are patterned a bit after this.

Basically, in New York a company has two options under which it can prove compliance with the standard non-forfeiture law for UL. I call them option A and option B because they appear as subparagraphs A and B in the regulation. Option A is an insurance department option, developed largely by the insurance department, and represents their wishes and their feelings. Option B is an industry alternative and was the option set forth by the industry. Normally you would expect some haggling and fighting back and forth and some compromise and you would have one set of rules, but they decided to put both in the law.

Under Option A the charges are limited and it is a pure retrospective minimum criterion. Mortality charges are limited to the CSO table for medically underwritten business and to the CET table for nomadically underwritten business. There is a bit of a give-up from the hard line position that you have to stick

precisely to the non-forfeiture basis. The New York Option A does contain a minimum interest rate guarantee. Policies filed under Option A have to have at least a 3% guaranteed interest rate. There are specified maximum expense charges. In the first year you are allowed to have 90% of a net level premium calculated on the non-forfeiture basis plus 10% of all other first-year premiums plus $10 per $1000, and plus $150 per policy, which is indexed.

In renewal years you can deduct up to $1 per $1000 on the first $100,000 of specified amount, 10% of any renewal premiums, and $5 per month which is also indexed. Basically you demonstrate compliance by showing that your charges are smaller than this or, in the case of surrender charges, that your initial surrender charge is smaller than the first-year expense charge permitted.

Option B is more typical of what you see in other states. There is a maximum initial expense allowance but it is not exactly the same formula as used in other states. It caps out at $50 per $1000 rather than $60 per $1000. When the regulation was first put forth I asked if this was on purpose or a mistake. It was on purpose. Under Option B there are no direct charge limits. If you read the regulation you won't find anywhere where your COI rates are limited to the CSO or the CET but as a trade-off for that you must offer the policyholder, at least once a year, a paid-up option based upon non-forfeiture mortality and non-forfeiture interest. As a practical matter I think that policies filed under Option B have a much higher likelihood of being approved if they meet some of the charge limitations of Option A.

MR. LAMSON: I have talked to several companies on what they are doing to value UL policies now. I have not taken any specific surveys. It would be my guess that most companies have been pursuing a "wait-and-see" approach on model regulation reserves. Some companies are performing approximate or aggregate calculations or else convincing themselves that holding reserves equal to cash values is adequate. Many companies are using consulting firms to have their reserve calculations done, particularly tax reserves.

MR. POLKINGHORN: Regarding non-forfeiture there is a chance that both the Life Committee Task Force proposals and the NAIC Actuarial Task Force proposals will be ignored. There is some thought that the Miller committee is currently working on non-forfeiture principles in general and that it may be foolish to come up with a quick fix that you will soon throw away. It would just lead everybody through another round of systems changes and a new set of rules and product filings only to have the rules change then a year later.

MR. BOOKER: The Society Committee on Non-forfeiture Principles, which is attempting to develop a rationale and draft a new model non-forfeiture law, has been meeting for over a year now and is starting to get somewhat close to a consensus. They don't have any numbers attached to their semi-consensus yet, but what they are headed towards is defining an insurance fund which is an accumulation of some function of the premiums less expense and mortality charges plus interest. This fund would be used to determine non-forfeiture insurance benefits in the event of a premium default. Right now they are still open or undecided about what the cash benefits should be once this non-forfeiture insurance benefit is determined. The options include not requiring any at all, so that you could sell a policy that only had insurance non-forfeiture benefits and no cash benefits.

Second option is the other extreme: make the cash benefits equal to whatever the fund is. You could go in between those, of course, and have the cash benefits equal the insurance fund minus some surrender charge. Or you could have a cash benefit that is defined independently of whatever the insurance fund is, some different retrospective accumulation of the fund.

The Committee has been working for a year and working very hard. They have some members who believe there should be almost nothing required at all, to others who believe that current non-forfeiture law is just about right and should barely be changed. Walt Miller and Doug Doll, who are the chairman and co-chairman, still hope to have a report out this year but I think the committee has a lot of work this summer to get that out.

I think it is obvious to all of you that the reserves for UL are fairly complicated. There are several reasons for that. Back in 1982 there was a lot of need to define a CRVM reserve so that you could have the right tax treatment for UL reserves, and that led to some of the complexity. Most of the complexity, though, is due to the perception that we need to account in the reserves for any forward guarantees that companies might have in excess of reserve standards. The Universal Life Task Force, at the request of NAIC, looked long and hard for ways to simplify the valuation rules and could not really find any that would always be simple and would always provide sufficient reserves, especially if there were forward guarantees. The last proposal we put out would have defined a safe harbor that would allow you to do without any projections if you didn't have any guarantees past the end of the next year. But if you did have such guarantees you would have to use all the rules that we have now.

MR. JOHN M. BRAGG: Some time ago I submitted a proposal concerning UL cash values, to the NAIC Actuarial Task Force. To the largest possible extent, the proposal was based on consistency with the Standard Non-Forfeiture Law for traditional policies. Since this matter of consistency was raised in the printed program for this meeting, I thought that a brief description of the proposal would be in order. The proposal has the merits of simplicity and consistency; traditional products, flexible premium universal, and fixed premium universal are treated alike, as far as possible.

The proposal leaves UL alone as far as design and operational features are concerned (flexibility, front and/or back end load, guarantees, more favorable declarations, etc.). It simply specifies underlying minimum cash values, the rules for which might not even be in the policy if compliance is provable at issue.

The underlying minimum cash value is based on a fixed, static accumulation. Premiums (less refunds) actually paid are accumulated; expense allowances and statutory mortality charges are deducted. Interest is at a fixed rate specified. The accumulation is not dynamic but is "static"; this means that the accumulation always moves from issue date and not from any previous level that the cash value might actually have reached. One could imagine a situation in which the actual cash value of the policy had reached, say $1,200, whereas the minimum cash value was only $800. (The Company would not be allowed to take away the extra $400 or to depart from any of its guarantees, but that is a matter of compliance with policy terms, and not a question entering into the definition of the statutory minimum value.)

The Static Retrospective Accumulation is therefore quite simple. If interest, mortality, and expense assumptions are the same, traditional products would have the same cash values using either the new accumulation process or the traditional prospective method.

The matter of interest rate is approached as follows. The traditional prospective approach specifies a maximum interest rate (125% of the valuation rate); this is done for fairness reasons, not solvency reasons. The mirror image of this fairness rule for retrospective accumulations would be 75% of the valuation rate (4.5% emerged for 1986 issues).

Mortality is of course based on the statutory tables. The expense allowances would require careful thought, but the following points come to mind:

- The SNFL first-year allowance would be used.
- Modal loadings and flat policy charges need not be accumulated.
- A reasonable percentage (to be determined) of remaining premiums would be accumulated. Percentages such as 65% in the first year and 87.5% thereafter come to mind from the annuity law. Before determining appropriate percentages, study might be needed of the typical relationship of adjusted premiums to gross annual premiums.

It is hoped that a proposal such as the above would greatly simplify the present situation and create the greatest possible consistency with the SNFL. Design flexibility would remain, and might even be enhanced.