

**1992 VALUATION ACTUARY
SYMPOSIUM PROCEEDINGS**

SESSION 8

Life and Annuity Valuation Issues

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LIFE AND ANNUITY VALUATION ISSUES

MR. ERROL CRAMER: I am the appointed actuary for the Allstate Life Insurance Company. I will be speaking about current rules regarding statutory formula reserves, specifically, issues to be aware of when preparing the 1992 year-end actuarial opinions.

The second speaker is Andrew Ware who is vice president and corporate actuary for Northwestern Mutual. Andy has been active in a variety of industry valuation issues, and he will be covering life valuation proposals.

Regarding the new NAIC standard valuation law, there are two significant points to be aware of: (1) having to meet the so-called 50 States Requirements, and (2) having to meet NAIC Actuarial Guidelines and other generally distributed interpretations of valuation requirements. This will be discussed further.

In prior years, the actuary's opinion stated that reserves met the requirements only of the home state. The wording under the new valuation law (as set out in the accompanying regulation), now reads that reserves be "at least as great as the minimum aggregate amounts required by the state in which this statement is filed."

Some might wonder how different this is from the current situation. The valuation law for a particular state applies both to foreign as well as domestic companies, so it would appear there has always been a requirement that one meets the valuation law of each and every state where licensed. However, an important distinction is that the responsibility is now shifted from the state commissioner onto the appointed actuary. Previously, the state commissioner would, in theory, choose whether or not to accept a valuation prepared for another state.

To my knowledge, only New York (which has many unique valuation requirements) has routinely required that additional reserves, if any, be calculated and disclosed, in a special

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supplement to the annual statement. The other states have generally accepted valuations as determined for the company's home state.

The appointed actuary is now required to make a legal statement, subjecting himself or herself to potential disciplinary action and professional liability, that the company's reserves meet the requirements of each and every state where licensed. Clearly, it is not feasible for the appointed actuary to research all 50 states with the same thoroughness.

It is instructive to look at the background behind this change in the valuation law. Originally, the NAIC proposal was that one meets the individual valuation requirements of each and every state where licensed.

The industry counterproposal was the reserves need to meet one's home state requirements, and need not be tested against any other state's requirements provided one's home state were accredited. The advantage of this proposal is that it would bring pressure on more states to be accredited. Accreditation, for those not familiar, is the NAIC stamp of approval given to states that meet certain standardized criteria. However, New York opposed this as New York's valuation requirements differ from the other states, accredited or not.

The final resolution was that the aggregate requirements of each state be met. This is a slight liberalization as it permits offsets of excess reserves on one product with insufficient reserves on another.

The proposed standards of practice for the appointed actuary (April 1992 exposure draft) refer to two sources that should be considered in interpreting the law: the NAIC Actuarial Guidelines and "other generally distributed interpretations of each regulatory authority."

The Actuarial Guidelines are produced by the NAIC's Life and Health Actuarial Task Force in response to particular questions as raised by the various states. Note that these are merely

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guidelines that attempt to provide uniformity of interpretation and are not legally binding for any state. Note also that states have on occasion differed from the guidelines.

The proposed standards refer as well to generally distributed interpretations, where emphasis should be noted on "generally." The appointed actuary should take heed of widely distributed information, for example, a letter from the state insurance department, but of course, he or she is not expected to be aware of a specific issue that a state may have raised with another company.

The appointed actuary is ultimately responsible for applying interpretations that he or she feels are appropriate and meet the law. Where an actuary's interpretation differs from the Actuarial Guidelines, or a state's generally distributed interpretation, the appointed actuary should disclose this and be prepared to justify. I believe the final standard of practice will specifically address this disclosure requirement.¹

Finally, the Actuarial Guidelines are not generally available, but are published by the NAIC.

Let's look at the status of the new valuation law. There are 10 states that have adopted the new law for 1992 but may or may not yet have adopted the accompanying regulation. The states are California, Colorado, Connecticut, Florida, Illinois, Minnesota, Missouri, Oregon, Texas, and Virginia.

New York has had its Regulation 126 in place since 1985, and it closely parallels the new valuation law. A revision to Regulation 126 will be sent out prior to year-end.

¹ The October 1992 second exposure draft on standards of practice for the appointed actuary require that any Actuarial Guidelines and other generally distributed interpretations of regulatory authorities which have not been complied with in regard to reserves, be disclosed in the supporting memorandum. Also, a proposal being considered by the NAIC Life and Health Actuarial Task Force would require that, where reserves are below the minimum aggregate requirements for a state, the reserve insufficiency be disclosed in the opinion for that state, together with its impact on the company's surplus and income.

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There are five other states that have adopted the new law with an effective date of 1993. These states are Alaska, Louisiana, Maryland, South Carolina, and Vermont.

For purposes of this session, 29 state insurance departments (those with actuarial staff) were requested to: "Please indicate what you believe are the major differences in your state's valuation requirement versus NAIC model requirements for life and annuity policies."

Responses were received from 19 states. I would like to point out that this was an informal survey, and Tim Harris of Milliman & Robertson, and Doug Doll of Tillinghast/Towers Perrin, are performing a more thorough study of state valuation variances on behalf of the American Academy of Actuaries. However, Tim and Doug's work may not be ready by year-end 1992.

A summary of the states' responses are included in the appendix. Some observations follow.

Only a few states definitely have major variances, and these are California, Illinois, Indiana, New York, and Texas. New York didn't respond to the survey, but is included here as it is well-known that New York does have major variances.

Most of the states merely indicated that they have no variances at all. This isn't surprising as most of the states follow very closely the wording of the NAIC model valuation law.

Some states did express doubts about being able to identify their variances. Presumably, they do not know to what extent their interpretations of special cases may differ from the other states or industry practice. I would like to emphasize here that this was an informal survey and should not be considered comprehensive.

The final point is that there are numerous interpretation issues that states handle on a company-specific basis.

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Let's look at the universal life commissioner's reserve valuation method (CRVM) as an example. California and Indiana differ from the NAIC universal life model regulation in that they require that the valuation mortality be the same as guaranteed mortality, and that the valuation interest rate not exceed the guaranteed rate. Also, California permits optional use of the so-called California method, which is the mean of the account balance and the cash-surrender value. The California method has the benefit of simplicity and may provide lower reserves for certain universal life plans.

Illinois has requested specific companies to reserve certain of their universal life plans as though they were term life. This applies for plans with secondary guarantees, for example, if a policy is guaranteed to remain in force for a specified number of years provided minimum premiums are paid. Illinois' concern is with term plans disguised as universal life essentially to avoid deficiency reserves.

Texas, as for California and Indiana, requires that the valuation interest rate be no more than the guaranteed rate. Also, Texas may require prefunding of steeply declining surrender charges.

Note that the Illinois and Texas interpretations would not be considered generally distributed items, and it is not clear that a company would be required to hold the higher reserves unless specifically requested by these states.

Now let's look at an example from the annuity side: so-called continuous versus curtable commissioners annuity reserve valuation method (CARVM). The issue has to do with annuities with, for example, a cliff-surrender charge: at the end of a contract year, the surrender charge may be in force, but on the very next day the surrender charge may be zero.

The NAIC model standard valuation law, which most states have adopted, defines CARVM in curtable terms. It talks specifically of the greatest present values at the end of each contract duration.

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New York sets out valuation requirements for annuities in Regulation 126, and continuous CARVM is explicitly required.

In 1989, Illinois sent out a circular bulletin stating that continuous CARVM should be used for so-called CD annuities (annuities with cliff-surrender charges). An advisory group of Illinois insurers was formed and met on several occasions with the Illinois Insurance Department, where it became evident that Illinois' concern was with specific insurers with potentially inadequate reserves. Apparently, Illinois has accepted curttate CARVM where cash-flow testing is done and where reserve adequacy is not in question.

Finally, an ad hoc group of the American Academy of Actuaries prepared a preliminary report on current annuity reserving requirements at the request of the NAIC. The group concluded that curttate CARVM applies. This is not an evaluation of the appropriateness of the reserve level, but merely an interpretation of what is the current law. This group has been superseded by the annuity advisory group that Dennis Stanley is chairing.

To summarize, 10 states have adopted the new law for 1992.

For each of these 10 states in which one is licensed, one needs to check compliance with the state's valuation laws and regulations. This needs to be done based on aggregate reserves only.

Also, one needs to check compliance with generally distributed interpretations of these states.

Furthermore, one needs to check compliance with all applicable NAIC Actuarial Guidelines.

Finally, one needs to disclose any noncompliances, and should document the justification for the contrary position in the actuary's memorandum or report.

I hope this gives you clear guidance for your 1992 valuation actuary opinions.

APPENDIX

Survey of State Life and Annuity Valuation Practices

Selected states were surveyed on what they believe are the major variances in their state's valuation requirements versus NAIC model requirements for life and annuity policies. Summarized here are the responses that are applicable to 1992 year-end formula reserves for life and annuity.

<u>State</u>	<u>Responses</u>
California	<ul style="list-style-type: none">● Regarding reinsurance reserve credits, California Bulletin 91-10 is more restrictive than the corresponding NAIC model requirements: (1) reserve credits are disallowed completely when renewal expense allowances are inadequate, and (2) the Commissioner may not approve exceptions. California intends to amend its Bulletin to conform with the NAIC.● Also regarding reinsurance reserve credits, California disallows if the sole purpose of the reinsurance is to reduce deficiency reserves or excess interest reserves (departmental interpretation).● For universal life, California Regulation 2544 requires that the valuation basis (interest and mortality) be no more favorable than the policy guarantees. Also, the "California" method, i.e, mean of cash-surrender value and account balance, can be used instead of universal life CRVM (this latter item could be a liberalization of the NAIC reserve level for certain universal life plans).● Unisex 1980 commissioners standard ordinary (CSO) is only permitted for plans legally required to be unisex, e.g., as under Norris.
Colorado	<ul style="list-style-type: none">● Requires use of a single valuation basis for certain policies (an informal requirement -- Colorado has proposed NAIC Guideline GGG on this topic). For example, a two-tier annuity must be valued using the same interest rate for both the deferral and the annuitization periods.● Otherwise, no major variances.

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<u>State</u>	<u>Responses</u>
Connecticut	<ul style="list-style-type: none">● Intends to be reasonable in accommodating any "initial dislocation" that the new NAIC valuation regulation may create. However, no known major variances.
Florida	<ul style="list-style-type: none">● Will accept all reasonable variations on the 1980 CSO tables.● No major variances.
Idaho	<ul style="list-style-type: none">● No major variances.
Illinois	<ul style="list-style-type: none">● Illinois Circular Bulletin 89-57 requires continuous CARVM for CD-type single premium deferred annuities (SPDAs) (departmental interpretation of NAIC Guideline VIII).● Requires certain universal life plans that essentially operate as term life to satisfy term-life valuation requirements, specifically the proposed new NAIC regulation "XXX" (departmental interpretation -- has proposed NAIC Guideline EEE on this topic).
Indiana	<ul style="list-style-type: none">● For universal life, Indiana Bulletin No. 54 requires that the valuation basis (interest and mortality) be no more favorable than the policy guarantees.
Iowa	<ul style="list-style-type: none">● No major variances.
Maine	<ul style="list-style-type: none">● No major variances.
Maryland	<ul style="list-style-type: none">● No major variances.
Massachusetts	<ul style="list-style-type: none">● No major variances.
Montana	<ul style="list-style-type: none">● No major variances.
Nebraska	<ul style="list-style-type: none">● No major variances.
Nevada	<ul style="list-style-type: none">● No major variances.
Oregon	<ul style="list-style-type: none">● Mortality in excess of 1980 CSO may be required for policy reserves for certain companies, for example, because of limited underwriting (departmental interpretation that 1980 CSO, when constructed, was intended to be sufficient for only 90 percent of companies)● Otherwise, no major variances.

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<u>State</u>	<u>Responses</u>
Pennsylvania	<ul style="list-style-type: none">● Unisex 1980 CSO is not permitted.● Otherwise, no major variances.
South Carolina	<ul style="list-style-type: none">● No major variances.
Texas	<ul style="list-style-type: none">● Regarding deficiency reserves for renewable term insurance valued on the 1958 CSO table, Texas Directive 12/15/81 is more restrictive than NAIC Guideline IV: 1958 CSO rather than 1980 CSO must be used for renewal periods of select and ultimate plans.● Regarding setting contingent surrender charges to zero in the reserve calculations, Texas Rules 3.1201 and 3.1202 are more restrictive than NAIC Guideline XIII: (1) life is covered in addition to annuities; (2) no distinction is made for meaningful versus nonmeaningful bailouts; and (3) surrender charges waived upon disability or other health reasons are considered to be contingent.● As for Colorado, Texas intends to follow proposed NAIC Guideline GGG.● Reserves for credit life must be at least 130% of 1958-CSO-based reserves or 150% of 1980-CSO-based reserves (Texas Law 3.6101).● For universal life, the valuation interest rate must not exceed the interest rate stated in the policy applicable for computing minimum nonforfeiture values (departmental interpretation).● For certain back-loaded universal life with steeply decreasing surrender charges, the reserve held in any policy year should be at least high enough to reach the reserve at the end of the next following policy year, assuming no premium paid and using the Fackler accumulation method (departmental interpretation).● Unisex 1980 CSO is not permitted.● Approval for destrengthening reserves is required even if not Texas domiciled. Destrengthening includes any changes which reduce reserve factors at any issue age, either for the current or

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<u>State</u>	<u>Responses</u>
Texas (cont.)	<ul style="list-style-type: none">● any future policy years (departmental interpretation of Article 3.28, Section 9, Texas Insurance Code). (As many companies may not have been aware of the Texas requirement for approval of reserve destrengthening, the Texas insurance department is apparently requiring this positively only starting in 1992).● For life policies, negative terminal reserves are not permitted, and net premiums must be sufficiently large in the early policy years to avoid negative terminal reserves (Texas Rule 3.309).● While absolute "mirror imaging" is not required, reinsurance reserve credits should be reasonably consistent with reserves set up by the assuming company, i.e., there should not be any substantial "vanishing" of reserves (departmental interpretation).
Wisconsin	<ul style="list-style-type: none">● Unisex 1980 CSO is not permitted.● Otherwise, no major variances.

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MR. P. ANDREW WARE: The draft regulation that implements the recommendations of the ACLI/National Association of Life Companies (NALC) advisory task force appointed as a result of the controversial Guideline XXX is a significant change to statutory reserving for term insurance. This regulation not only introduces a new reserve methodology for nonlevel premium life insurance reserves, but it also allows the use of new optional 15-year select factors to be applied to the 1980 CSO. These new select factors can be used to determine reserves for all life insurance plans, not just term. Because this regulation is so far-reaching, it is important that all life insurance actuaries, both pricing and valuation actuaries, understand this new regulation and its implications.

History of XXX

Late in 1988 Roy Olson, the actuary for Washington state, introduced Guideline XXX to the Life and Health Actuarial Task Force. The guideline prescribed a segmented method of calculating reserves for increasing premium policies that do not produce a cash value in the first 10 years. At the June 1989 meeting of the Life and Health Actuarial Task Force, several actuaries from the industry opposed Guideline XXX. This controversy resulted in the forming of a joint ACLI/NALC advisory task force to advise the Life and Health Actuarial Task Force on what should be done. The first report of this advisory task force was submitted in November of 1990, with the final report submitted in September of 1991 only slightly changed from the first report. At that point in time, the Life and Health Actuarial Task Force requested that the advisory group draft a regulation that was submitted in March of 1992. This regulation was officially voted on by the NAIC Actuarial Task Force to be exposed for comment in June 1992 at the NAIC's meeting in Washington, D.C.

In order to understand the differences between current practice and the proposed regulation, the different methods are defined as follows:

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- **Unitary Method:** In this method, net premiums are calculated as a constant proportion of gross premiums for the entire length of the plan.
- **Segmented Method:** A policy is divided into segments of varying policy years, and then net premiums are calculated as a constant proportion of the gross premiums within each segment of the plan.

The determination of the segments is what differentiates segmented methods. Examples of segmented methods are the unified method that was described in a paper by Stephen Beach, published in the Transactions of the Society of Actuaries, Volume XLII (42) entitled "Statutory Reserves for Non-Level Premium Policies." Another example is the net-to-gross-ratio method that is part of the regulation. The net-to-gross-ratio method varies only slightly from the unified method.

Another example, of course, is Guideline XXX. All of these examples produce very similar results for the plans that were tested by the advisory group. The biggest controversy in this entire process was not the method used to calculate reserves, but rather the mortality assumption required to be used.

Guideline XXX was brought about by regulatory concerns over the use of the unitary method in calculating reserves for nonlevel premium products. Frequently, the unitary method produced negative terminal reserves. A negative terminal reserve implies that the present value of future benefits are less than the present value of future net premiums. Or looking at it from a retrospective standpoint, the past premiums have not been sufficient to pay past benefits. Therefore, at the point in time a terminal reserve is negative, future net premiums are to be used to pay past benefits. This is the flip side of prefunding, and to the regulators it meant companies were betting that future inflated premiums would be paid. The regulators also believed that negative terminal reserves were caused by premium manipulation in order to avoid deficient premium reserves. Under the unitary method, tilting a premium slope so that premiums in later years are very high, produces early duration net premiums that can be quite low, thus avoiding deficiency reserves. In fact, these net premiums can be significantly lower

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than the statutory cost of insurance. It was viewed by the regulators that many of these later premiums would never be paid, or if they were, would be paid only by people who were so sick that significant antiselection would result.

On the other hand, the industry actuaries responding to Guideline XXX felt that it produced excessive reserves mainly due to extremely conservative valuation mortality rates, especially when compared to the experience of many preferred-risk term writers. Guideline XXX reserves were viewed to be very difficult to calculate.

In both its reports, the ACLI/NALC advisory task force cited many failures in the standard valuation law. Major points included the fact that the standard valuation law does not consider lapses, and it does not deal with mortality changes that can occur over time. It also does not reflect risk classes in that preferred risks are not specifically allowed for. And finally, it does not recognize there are interrelationships of the above factors, especially between lapses and mortality. The report also cited that the Guideline XXX produced inappropriately high reserves and it was difficult to calculate, but the task force also found that the unitary reserves can be insufficient. The reports made several recommendations with respect to mortality and the calculation of reserves. These recommendations have been incorporated in the draft model regulation.

Draft Model Regulation

The first part of the draft model regulation allows for the use of optional 15-year select factors for all life plans. These 15-year factors differ depending on which types of reserves are being calculated. For basic reserves or, in other words, reserves without consideration to the size of the gross premium, select factors applied to the 1980 CSO result in mortality rates approximately equal to a 150% of industry mortality. For purposes of determining these select factors, a mortality table was constructed using SOA data from 1983 to 1986 policy anniversaries. When the size of gross premiums are considered, deficiency reserves can be calculated using a set of select factors based on only 120% of industry mortality.

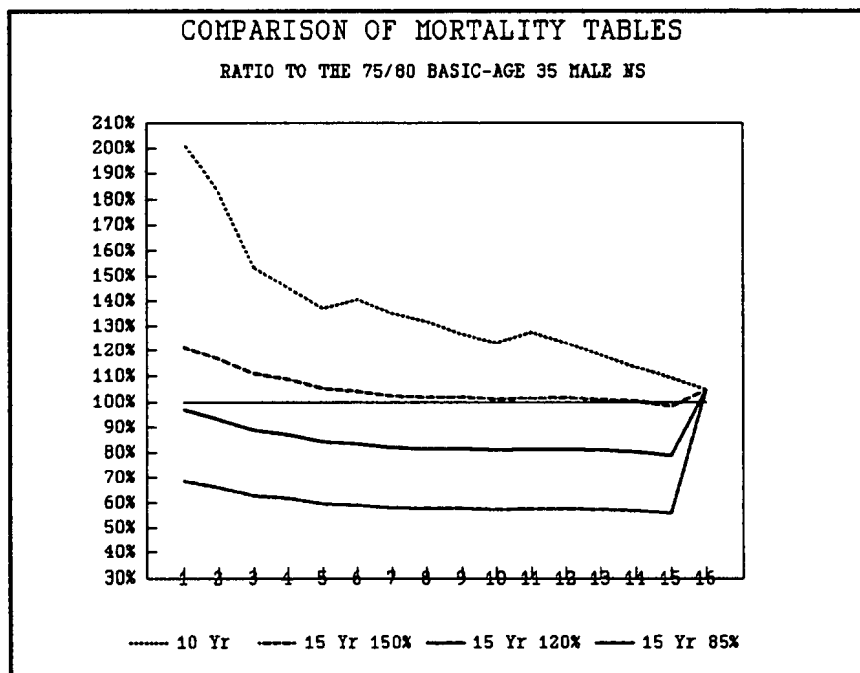
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The regulation requires the use of the 15-year select factors for basic reserves if the 15-year select factors are used in calculating deficiency reserves.

Finally, deficiency reserves may be based on as low as 85% of intercompany experience if the actuary can demonstrate that company experience is or will be low enough to justify this level. This provision would enable preferred risk carriers to use their actual or expected experience in justifying deficiency reserve mortality levels.

Chart 1 gives a good idea of the level of mortality being recommended by the task force. The mortality rates are all expressed as a ratio to the 1975-80 basic tables. I am using the 1975-80 basic table here as a measurement device. It is a table constructed using the combined mortality of smokers and nonsmokers and covers a period of time that is quite old now, so there has been both mortality improvements since then and a clearer definition and distinction between nonsmoker and smoker mortality.

CHART 1



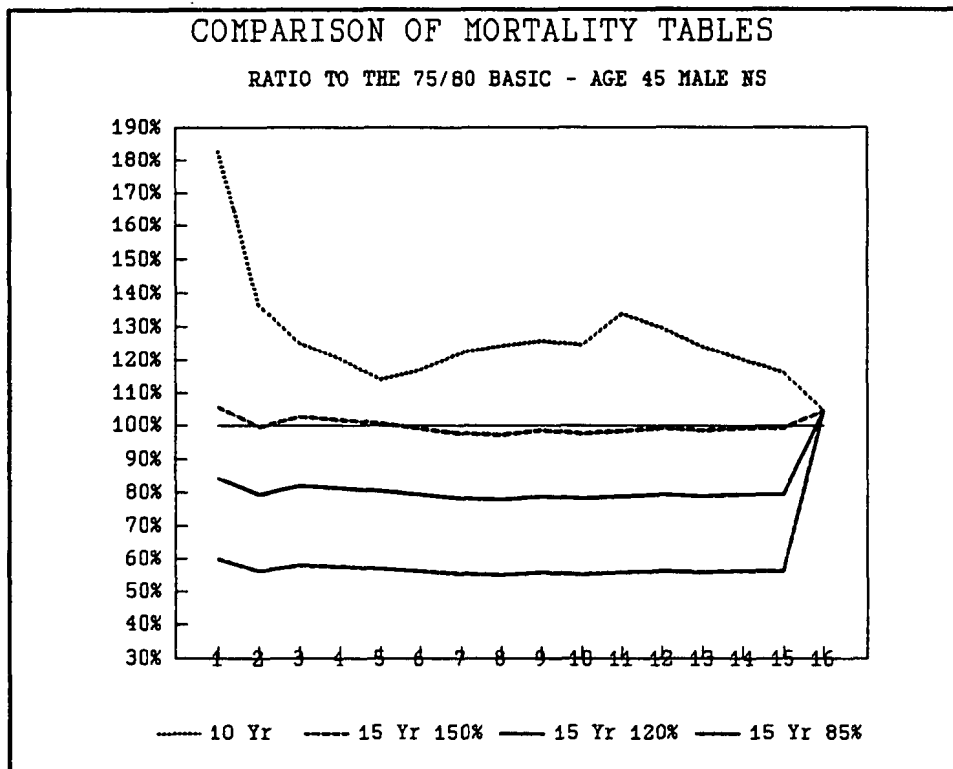
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In Chart 1, issue age 35, the current 1980 CSO 10-year select mortality rates are compared to the 15-year select mortality at 150% to be used for the basic reserves, the 15-year 120% rates to be used for deficiency reserves, and the lowest rates possible, 85% of current experience, which is the bottom line. When these mortality tables are expressed as a function of the 1975-80 basic tables, it is evident that the current 10-year select factors are not a good approximation of true select mortality over the first 15 policy years at age 35. The 150% mortality rates starts out at about 120% of the 1975-80 basic tables. But by duration five is down almost to 100% and stays there all the way to the 15th year and then jumps back up to the ultimate 1980 CSO at that point. Of course, the 120% and the 85% follow similar patterns with the 85% level at between 60% and 70% of the 1975-80 basic table.

In Chart 2, issue age 45, it can be seen that the current 1980 CSO 10-year select mortality line is much more jagged than the other lines and considerably above the other lines, whereas the 150% basic reserves table lies almost exactly on top of 100% of the 1975-80 basic table. This is a coincidence, but it does show that the pattern of mortality to be used under this new regulation is very close to the pattern of mortality that we are used to seeing in the intercompany studies.

In Chart 3, issue age 55, the same pattern is seen, except the overall mortality level is even lower with the 85% table coming in at around 50% of the 1975-80 basic table.

CHART 2



If the policy being valued has premiums that increase more rapidly than the 1980 CSO, then the select factors must be increased to reflect the expectation of higher mortality due to lapse antiselection. The increase in mortality is done through an algorithm that was not constructed scientifically but seems to produce the proper result. The algorithm increases the select factors by one quarter of the cumulative difference between the percentage increase in gross premiums and the percentage increase in the ultimate 1980 CSO. For example, Table 1 shows a policy with the first three years of gross premiums increasing at about 13% at an age where the 1980 CSO increases at only 5-6%. One quarter of the difference in these increases is about 2%, so the select factor for year two was increased from 51 to 53%. The select factor for duration 3 increased from 62 to 66% since the algorithm computes the cumulative difference. If this example were carried out further, the select factors would reach 100% at duration 11 instead of duration 15. Select factors are not increased beyond 100%, since the ultimate 1980 CSO was deemed conservative enough to handle most antiselection due to lapsation.

CHART 3

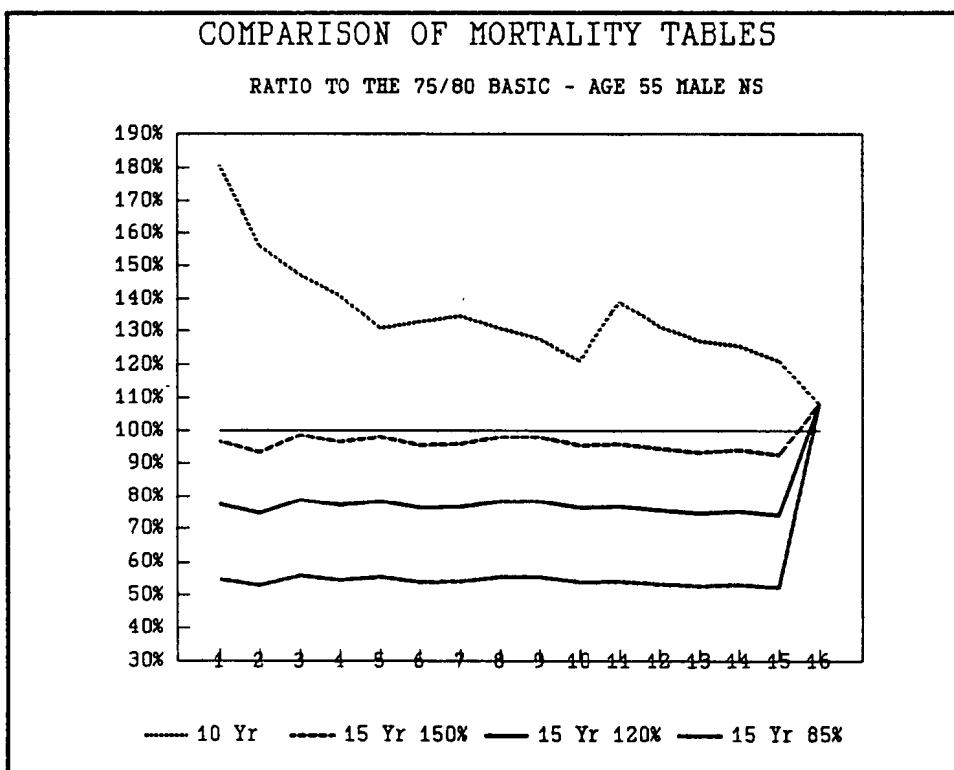


TABLE 1

Adjusted Select Factors

<u>Dur.</u>	<u>(1) Gross Prem.</u>	<u>(2) % Inc. Gross Prem.</u>	<u>(3) 1980 CSO</u>	<u>(4) % Inc. 80 CSO</u>	<u>(5) 0.25% (2) - (4)</u>	<u>(6) Sum of (5)</u>	<u>(7) Select Factors</u>	<u>(8) Adj. Factors</u>
1	1.44		1.68				45.0%	45.0%
2	1.63	13.0%	1.77	5.4%	1.9%	1.9	51.0%	53.0%
3	1.85	13.5%	1.88	6.2%	1.8%	3.7	62.0%	66.0%

The net-to-gross-ratio reserve method is the final part of the regulation. This is a method of dividing up a life insurance policy into segments in order to reserve each segment using a unitary type approach within each segment. The net-to-gross-ratio method applies only to nonlevel premium or nonlevel benefit life insurance policies.

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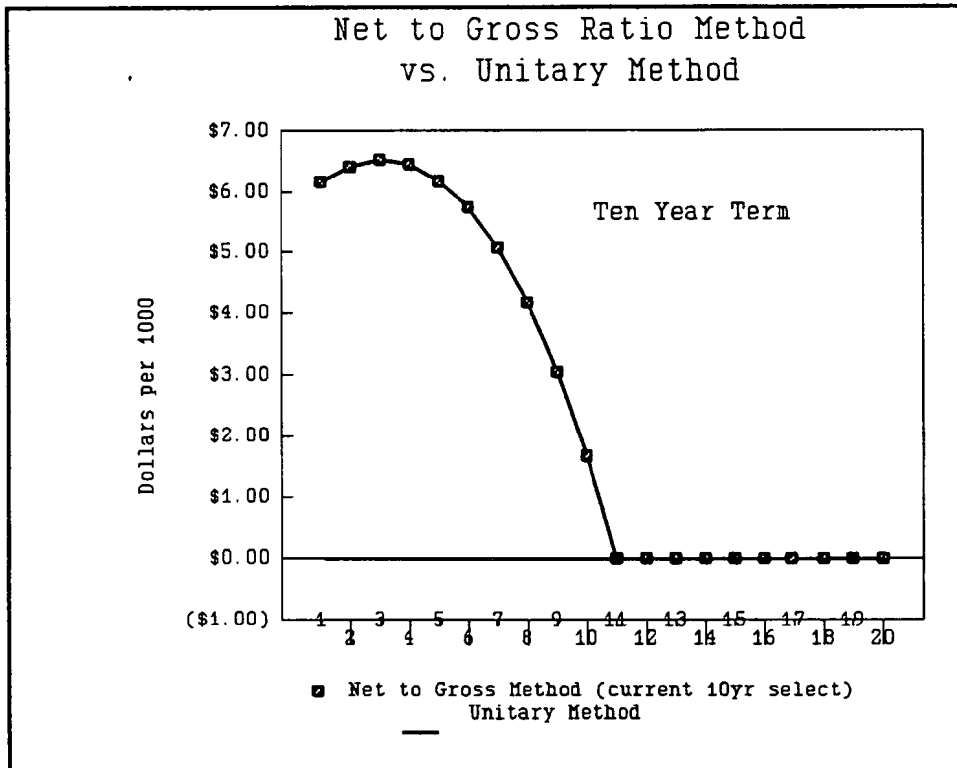
Under this method a ratio is computed for each possible segment equal to the present value of benefits divided by the present value of gross premiums over the length of the segment. Since segments are only considered possible over complete policy years, the first possible segment would be the first policy year. The second possible segment would be the first two policy years, and so forth. The length of the first segment is chosen to be the last duration at which this ratio is at its maximum value. Once the first segment is determined, then subsequent segments are calculated by repeating the process, but by starting at the end of the first segment. The process is repeated until the whole policy is segmented. This process is not as difficult as it may first appear.

For a policy that has level guaranteed gross premiums for 10 years and increasing thereafter, in all likelihood, the end of the first segment will be at the end of the tenth policy year. The resulting net premiums for the first 10 years would be just the net premium for a 10-year, level-premium term policy. In this way, a policy that has 10 level premiums followed by increasing premiums would have the same reserves during the first 10 years as a 10-year, level-premium term policy. It did not seem logical to the advisory group that a policy would be reserved on a lower basis just because ART-type premiums continued beyond the end of the 10th year. However, the consequence of changing the reserve method without changing the mortality would, for many companies, produce deficiency reserves where there had been none before.

Chart 4 shows the consequences of using the current 10-year select factors for a term policy with level premiums for 10 years and increasing thereafter. A premium of \$1.00 per \$1,000 at age 35 was assumed to be guaranteed for 10 years. Under the net-to-gross-ratio method, the valuation net premium was over \$1.80 during the first 10 years. That deficiency produced initial reserves of over \$6 per \$1,000 on a \$1 premium. These reserves were viewed as redundant by the actuaries on the advisory task force, and therefore, the reduced select factors were recommended.

The effect on this plan of the recommended 15-year select factors is shown in Chart 5. The top line represents the reserves calculated using the current 10-year select factors and is the

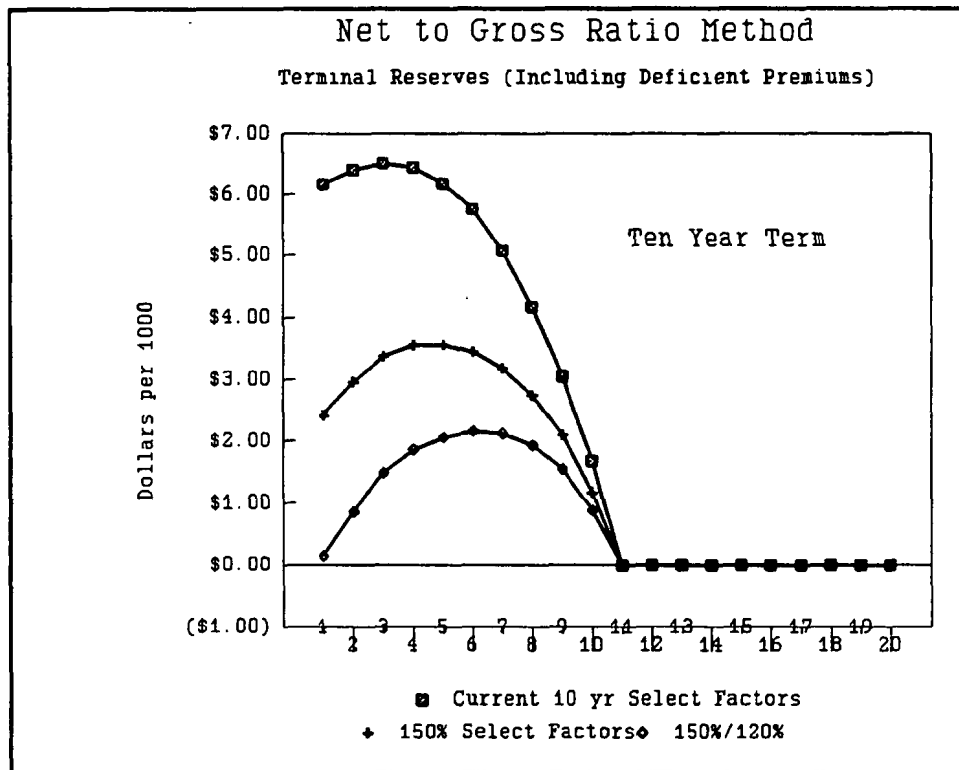
CHART 4



same one as in Chart 4. The next lower reserve line shows the reserves, including deficiency reserves, that were calculated using the 150% select factors only. The bottom reserve shows a combination of basic reserves at 150% select factors and deficiency reserves using the 120% level of mortality to calculate those extra reserves. This shows that, even if there are no deficiency reserves, this regulation introduces what one of the task force members called the humpback reserve for the level-premium term product. For this age, the reserve reached a maximum of about \$2 per \$1,000 in the sixth year. Even though the reserve releases by the end of the 10th year, if pricing is done on a rate of return method, there is a cost of setting up those reserves.

A unique aspect of the proposed regulation is the provisions dealing with justifying deficiency reserve mortality at lower than the 120% level. This provision was added primarily to

CHART 5



accommodate preferred risk underwriting. It allows the actuary to use lower select factors if company experience is credible enough and low enough. The first way an actuary can justify lower rates is called retrospective experience in the regulation. The actuary needs to have at least 100,000 life years of exposure in order to justify mortality at lower than 120% level. The mortality table used to calculate deficiency reserves cannot be less than 120% of the company's actual experience. In other words, the company must maintain at least a 20% margin between its actual experience and the experience table used for calculating deficiency reserves. After initially justifying the experience, the actuary must annually rejustify the mortality basis, and the data used for this rejustification must include data up through 12 months prior to the statement day.

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However, if a company is just starting out in the preferred risk area and expects to have lower mortality, then for a period of three years or until 100,000 life years of experience is accumulated, whichever comes first, the company may base the assumption on "prospective experience" or in a word, opinion. However, if the three years comes without 100,000 life years of exposure being accumulated, then the actuary must use a blend of deficiency reserve mortality at the 120% level and company experience. The blend is a weighted average depending upon the portion of 100,000 life years actually accumulated.

Another way an actuary can justify experience is to use reinsurer's experience where the reinsurer is assuming at least 10% of the risks on the block. This provision was designed for smaller insurers. In this way a reinsurer can pool similar blocks from many insurers and use the combined experience to get the 100,000 life years of experience.

When justifying experience, the actuary may use blocks of experience of the same underwriting class, not just the policy forms that may produce deficiencies. So, a company could have a preferred risk class that it offers to whole life, universal life and term, but may only choose to use select factors for deficiency reserves on term. It can use the experience of all the underwriting class to justify a level of mortality.

By the same token, adjustments must be made to risk classes that are not as good as the best class to account for the best risks being skimmed off.

The regulation specifies 100,000 life years of exposure as minimum, however, when performing experience studies using amounts of insurance instead of number of lives, the distribution of policies by size has a very large bearing on the degree of variance that actual experience will exhibit. Monte Carlo testing was done on two different size distributions, each with 100,000 life years of experience. In one block, I assumed all of the policies are the same size and the other block has a typical distribution of policies of various sizes. A wide variety of policy sizes affects greatly the degree of confidence an actuary can have that the actual underlying mortality is being accurately portrayed by experience studies done on an amount at risk basis. The wider

the variety of sizes, the wider the variance of the distribution of possible claims. After running a Monte Carlo test simulation with 100,000 life years of exposure 1,000 times, two frequency distributions were calculated and have been overlaid on Chart 6. The distribution for policies with various sizes is significantly wider than the distribution of policies with the same size. From these distributions the answer to the question, "What is the chance that a company would get a reading about experience from a mortality study and then add 20% to it for safety and still be using mortality that is actually less than the underlying mortality?" can be found. For the uniform distribution, the chance was about 7%. However, that chance grew to about 18% when you had various sizes. Thus, even with a 20% margin, a company with only 100,000 life years of exposure may run close to a 20% chance that actual underlying mortality exceeds the mortality table used for deficiency reserves. Of course, if the company had a million life years of experience, these numbers shrink to negligibly small levels. When justifying deficiency reserve mortality levels, the actuary must be very careful in ascertaining whether or not the experience is actually being accurately portrayed by the experience study.

Guideline EEE

As originally drafted, the proposed net-to-gross-ratio method does not apply to universal life. However, recently there have been some universal life products introduced with a term feel to them. Provisions like a no-lapse guarantee, which assures the product stays in force if a minimal premium continues to be paid, can make a universal life contract look like term. Because of the implicit assumption that the policy will be funded for life in the universal life reserve regulation, there are generally no deficiency reserves created by this type of temporary guarantee. In other words, as long as the guaranteed maturity premium exceeds the minimum net valuation premium, no extra reserves are required. A company can then create a term look-alike plan with a universal life wrapper and avoid deficient premium reserves.

Guideline EEE is an attempt to put these contracts on an equal footing with term plans by requiring an additional level of testing against minimum reserves for plans with longer than a five-year, no-lapse guarantee. Under the guideline, all universal life plans with a no-lapse

guarantee of more than five years will have to hold at least minimum term reserves for the no-lapse-guarantee period.

The Life Committee of the American Academy of Actuaries opined that this guideline did not go far enough to assure consistent treatment of universal life term plans with regular term plans. This is because there are other ways to make universal life look like low premium term. One way is to guarantee very low cost of insurance charges for a number of years and not have a surrender charge. The Life Committee suggested that, whenever the guarantees of a universal life policy generate an implied minimum premium less than the net valuation premium calculated over the length of the guarantee, then term minimum reserves need to apply over the length of the guarantee as well as universal life minimum reserves. The basic principle is that, if the guarantees of a universal life policy and the guarantees of a traditional policy are equivalent, then the minimum reserves should be equivalent.

California Universal Life Reserve Regulation

California's universal life reserve regulation is an example of the type of rule that an appointed actuary will need to be concerned about when considering the question of whether or not the company's reserves are at least as great in aggregate as those required in the state in which the statement is being filed. The California regulation may produce higher reserves than are being held by the company. For example, the California regulation requires the use of lower of the policy guaranteed interest rates and the statutory rate when taking present values. Alternatively, the company can choose to hold the mean of the account value and the cash value. In addition, for interest guarantees longer than one policy year and greater than statutory reserve rates, the rules require an excess interest reserve.

CHART 6

