Where Creative Design Meets Market Needs
Society of Actuaries
Product Development Section

# PRODUCT MATTERS

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## *Structured Creativity: Six Sigma Quality and Product Development*

*by Eva Goldstein*

### *Introduction*

Product development is variously described as a science, an art, or a philosophy. Six Sigma suffers from the same ambiguity—it is a statistical measure, a business philosophy, a process, a methodology, and a way of living! But by combining the two, we are able to apply structure to creativity and enable product success.

Many people balk when they hear they words "creativity" and "structure" in the same sentence—it is commonly believed that structure stifles creativity. However, how many good ideas never see the light of day because there is no process in place for bringing them to the attention of company decision makers? And how many bad ideas are brought to market because there are no controls in place to prevent their development? My guess is a lot!

Six Sigma is a quality initiative implemented across all GE businesses. It is a data-driven, customer-focused, and customer-touching approach to doing business that looks at whether an organization is delivering what its customers require. We measure product or process performance against what our customers

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## *In This Issue*



## *Thoughts on the Enhanced Earnings Death Benefit*

*by Douglas L. Robbins*

The 1990s saw the rise of many types of variable investment products within the life insurance industry. It was only natural that hedging strategies and products would emerge in response to the inherent risk of loss of value in variable life and annuity products. This article explains a 21st-century twist on the concept for annuities, the Enhanced Earnings Death Benefit (EEDB) Rider.

The advent of this rider sparked quite a bit of interest in the industry. This is at least partly because, as a rider that increases in cost to the insurance company when separate account assets increase, it is countercyclical to many other riders sold (as well as the profitability of the base annuity product itself). For this reason, we believe that this rider can be less risky to offer, even in a relatively rich form, than it appears on its surface.

### *Past Guaranteed Death Benefit Riders*

Several types of Guaranteed Minimum Death Benefits (GMDBs) have been sold within both base deferred annuity products and riders throughout the 1990s. The general form of these riders is to assess a charge as a percent of the annuity fund value and provide a floor death benefit regardless of fund performance. The various ratchet and roll-up benefits that were sold were intended to help the annuitant with estate planning amidst volatile equity markets.

However, they did not address certain tax considerations that affect deferred annuities upon death of the annuitant. Life insurance offers several tax advantages over deferred annuities on death. With a life policy, the death benefit is much higher than the cash value, and policy gains (on death) are not subject to federal income tax. For example, say a policy has cumulative premiums of $50,000, a cash value of $80,000 at the time of death, and a face amount of $150,000. If the insured dies, the entire $150,000 goes to the beneficiary free of federal income tax.

Annuities have neither of these advantages. Gains on a non-qualified deferred annuity are subject to federal income tax, whether as a result of gains in the fund value or as a result of a GMDB. (On a qualified product, the entire amount paid on death is taxable.) So, expanding the above example, say an annuity had the same cumulative premiums, cash value, and death benefit (due to say a bull market up to a ratchet point, followed by a bear market). In this case, the annuitant's estate could lose up to $40,000 to federal income taxes (based upon the 40% tax bracket, combined with the $100,000 gain).

There are also estate tax considerations on death, and these can vary a lot under current law by date of death. However,

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## Thoughts on the Enhanced Earnings Death Benefit

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these are beyond the scope of this article, and in any case, the insurance industry has not yet devised a product that deals with them.

### *The Next Wave: The Enhanced Earnings Death Benefit Rider*

Within just the past couple of years, a new product has been developed to help meet these limitations, with particular emphasis on the taxable gains. The Enhanced Earnings Death Benefit Rider is designed to shield the gains by adding sufficient funds to cover the federal income tax on them, at least in part. (The most common percentage is 40%, or 25% at higher issue ages.) In the above example, the EEDB on death might be $40,000.

Note that the benefit amount would itself be subject to FIT for riders that are structured as an enhanced death benefit on a deferred annuity. There is a variation in which a life insurance rider pays a non-taxable death benefit; but this has to be funded with an influx of after-tax funds from outside the annuity or from a possibly taxable partial withdrawal.

The EEDB is a step forward, then, but it is only the first step. The most common current product designs typically cap the benefit payable, often at 40% of the cumulative premium. Furthermore, gains covered under the EEDB rider do not include gains created by a GMDB, although those gains are still taxable.

So in the example above, only $12,000 (40% of the $30,000 gain within the contract's cash value) would be paid under the EEDB. That would mean a taxable income exposure of $28,000 uncovered by the rider. And even if the $150,000 death benefit were equal to the cash value at the time of death, the rider's benefit cap would limit the benefit to $20,000. The rider, if it is capped in this way, fails to fully meet its purpose for existence. And, this effect becomes worse the higher the fund value (or GMDB) grows.

However, an uncapped EEDB, which would cover all gains, regardless of fund performance, would at first appear to be exceedingly costly. Let's say, for example, that a variable annuity has 8% fund value growth (after base product loads) each year. For simplicity, assume a population in which all members live for 25 years, and then all die at exactly that point. In that time, an annuity starting at $50,000 would increase to about $342,000. Upon the eventual death, the EEDB additional benefit would be about $117,000. Funded over 25 years as a percent of account value, and assuming a net earned rate of 7%, this costs over 1.50% of fund value per year (whereas our calculations show that the capped benefit would cost only about 0.25%).

It seems clear that a 150 basis point cost could not be supported by typical product loads, and that most policyholders would be unwilling to pay such a rider charge. But this cost does not take into account the normal policyholder behavior that occurs in terms of lapsation and partial withdrawals; nor does it take into account the maximum maturity age on most deferred annuity products.

Assuming an average 10% annual decrement rate over the 25 years until death in the above example reduces the 1.50% for an uncapped benefit to 0.34%. And if we were to charge 35 basis points for the rider, the resulting reduction to the 8% net earned rate would drop the annual cost further to 0.32%. Given these conditions, we look to be near a solution. But on the other hand, if the average annual net fund

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value growth (before rider charges) doubled to 16%, our annual cost would increase back to over 1.10% of fund!

***Actuarial Analysis Can Frame the Risks***

This looks like a daunting risk to take at first glance. How can one offer a benefit for which you would charge 0.35% on an expected basis, but which might easily cost so much more than that?

We would suggest that the answer lies in taking a holistic view of the annuity product combined with the EEDB rider. The reason for the increase in the rider's cost on the 16% net return scenario is that we expected the fund value (per policyholder remaining, at $50,000 initial premium) at the end of 25 years to be around $300,000 (at 8% net growth), and at 16% net growth, it was almost $2 million.

But let's take a look at what else might be going on. Let's say that, to sell this annuity, we will have 8% of the premium up-front as acquisition costs. In addition, let's also assume that to maintain it will cost us $100 per year. Assume that the M&E and other fund-based revenues amount to 1.75% per annum.

Under this set of assumptions, the additional product and rider asset charges we would take in at 16% fund growth (accumulated to year 25 at our 7% rate) would more than offset the increased cost of the EEDB. (Pricing on an IRR basis, one would be even further ahead, because the implied discount rate on the eventual death benefit enhancement is then much higher than 7%.) Even if we decide we must cap the EEDB at some (higher than current) level in order to help manage the risks, it seems clear that it could be much higher than where much of the industry currently has it set.

In fact, some producers of late appear to be taking this view, at least to an extent. A few companies have raised the maximum benefit on their EEDB riders from 40% to 100% of premiums paid (while also increasing the asset charge for the rider). Perhaps this indicates growing recognition that a richer EEDB provides a stronger countercyclical effect within a variable annuity than a less rich version.

A key assumption making much of the preceding reasoning possible is the date of death. (If death were expected in 5 years in our example, then no reasonable rider charge would cover that cost.) Clearly, it is crucial to control the mortality that will occur in order to maximize the benefit to the company of offering this rider. There are several ways to do this, aside from underwriting, but we will not cover them here. The important point is that, having done so, we could possibly offer a very attractive benefit indeed.

***Conclusion***

Because the EEDB rider is countercyclical to not only the base annuity product, but also to most other guarantees currently offered on variable annuities, two things seem clear:

- This rider offers some degree of risk management, as we have demonstrated in our admittedly simple example. This alone should make this rider very popular for insurance companies in the variable annuity market.
- It should be possible to offer this rider in such a way that it better meets its estate preservation goal. Caps on the benefit could be higher or maybe even non-existent.

We will see in the future how these ideas all play out.

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## Structured Creativity

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have told us that they need. Design for Six Sigma (DFSS) is a methodology, or framework, for developing processes and/or products that meet customer needs. Design for Six Sigma for innovation (DFSS/i) is a sub-set of DFSS, focused on bringing new, innovative products to market. DFSS/i can be a powerful tool for successful product development.

***The Need for Something Different***

In today's environment, insurers are faced with having to develop product solutions to address increasingly complex risk management problems. Customers are more sophisticated and more demanding, and their needs are changing as quickly as market conditions. These factors, along with expanding global competition and a focus on growth contribute to a need for increased operational efficiency and increased innovation. Both of these require more effective use of ever fewer resources.

In this environment, successful insurance manufacturers are those who focus on unique product benefits and develop well-defined product plans, by using more non-traditional tools in market research, such as a team-based approach. By involving cross-functional teams earlier in the product development process, the following can be achieved:

- Direct access to customer knowledge;
- Ownership and buy-in across functions;
- Earlier detection of changing customer needs;
- Broader perspective in understanding the market; and
- Faster time-to-market of the new product.

The use of cross-functional teams is fundamental to the successful execution of any Six Sigma project.

***DFSS for Innovation***

GE uses DFSS/i to lower the risks and the costs associated with new product innovation. DFSS/i is a data-driven approach to assessing business opportunities and



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## *Comments from the Chair...*

***by Mary J. Bahna-Nolan***

I can't believe this newsletter comes to you at the start of 2002. I hope all of you had a successful year! It certainly was not without its challenges.

I hope you like the new look of our newsletter—or at least our new name, *Product Matters* submitted by Boris Brizeli. A special thanks to all who entered our Name the Newsletter Contest—we had nearly 200 entries!

I would like to offer congratulations and thanks to our retiring chairperson Deanne Osgood. Deanne completed her three-year term at the Annual Meeting in New Orleans. With Deanne's leadership, we accomplished a lot—our first Product Development Actuary Symposium, a new name for our newsletter, the design of our new logo, the improvement of our website and the re-release of our Product Development CD-ROM, "a look at product development" for professional development credit (a great educational tool for beginning product actuaries). Deanne brought a great deal of leadership, creativity and focus to our section and we are all grateful that she has agreed to stay involved as a Friend of the Council. A special thanks also goes to Susan Kimball and Kevin Howard, who both stepped in last year to fill one-year terms for seats that were vacated by two members unable to fulfill their three-year commitment. Both Susan and Kevin were instrumental in helping us achieve our accomplishments last year and I am glad that they were both re-elected to three-year terms. I would also like to welcome our newest member, also elected to a three-year term, Paul Haley.

2002 is going to be a busy and challenging year for the Section. Planning is well underway for our second annual Product Development Actuary Symposium, which we will again co-sponsor with the Reinsurance and Nontraditional Marketing Sections. The Symposium provides a great opportunity for more advanced product actuaries to continue their education, learn new approaches to pricing and modeling, as well as network with friends and colleagues. We are also planning another seminar, Tying Together Profitability Measures, which should aid product actuaries in communicating and translating pricing results to financial officers and senior management. Both the seminar and the symposium will be held in Chicago on June 12 and June 13-14, respectively. We are also actively recruiting speakers for sessions at the Spring Meeting and busily planning sessions for this year's Annual Meeting in Boston. We are going to try something a little different for the Spring Meeting—a seminar format with several sessions centered round a few central themes. We hope you find this type of format beneficial.

*Mary Bahna Nolan*

> *"I hope you like the new look of our newsletter—or at least our new name,* Product Matters *submitted by Boris Brizeli. A special thanks to all who entered our Name the Newsletter Contest—we had nearly 200 entries!"*

One of our challenges for 2002 is how to best serve our membership. We know we need to do a better job communicating with you. We need your help with articles and ideas. Financially, our Section is sound and we did not need to increase dues for 2002, but we need to determine how best to spend our funds to be of the most benefit to you. I encourage you to send me or any of the Council members your thoughts and suggestions.

I look forward to serving as your Section Chair over the next year!

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## Product Development Section Photos from the Annual Meeting

*The Product Development Section Council takes a break during a planning session at the Annual Meeting in New Orleans*

*(Left to right): Kevin Howard, Susan Kimball, Mary Bahna-Nolan (2001-2002 section chair), Nancy Kenneally, Deanne Osgood (2000-2001 section chair), Noel Abkemeier*

*(Above): Changing of the Chairpersons - Mary Bahna-Nolan, (right) new section chairperson, presenting a crystal clock with the Product Development Section's new logo to the retiring chairperson, Deanne Osgood.*

*(Below): Deanne Osgood, retiring chairperson, describing the section's past and future activities at the Product Development Section breakfast at the Annual Meeting in New Orleans*

# At Last — A Permanent MEC Correction Procedure

*by Brian G. King and David C. Miller*

## Introduction

On August 6, 2001, the Internal Revenue Service issued Revenue Procedure 2001-42 (Rev. Proc. 2001-42), establishing a permanent avenue for companies to correct inadvertent modified endowment contracts, or MECs. The insurance industry had been without an MEC correction program for over a decade before the IRS published Revenue Procedure 99-27 (Rev. Proc. 99-27) in May of 1999. Rev. Proc. 99-27 was a temporary procedure, however, and when it expired on May 31, 2001, the insurance industry was again without a process to correct inadvertent MECs.

Rev. Proc. 2001-42 is much broader in scope than its predecessor, as certain MECs that were ineligible for correction under Rev. Proc. 99-27 can now be corrected under this new procedure, including corporate-owned life insurance contracts and contracts with funding levels that exceeded prescribed limits defined in Rev. Proc. 99-27 (i.e., the 300% test and the 150% test).

Because of the complexities of administering contracts within the requirements of § 7702A of the Internal Revenue Code, companies will continue to have inadvertent MECs, even those companies that took advantage of Rev. Proc. 99-27. Having a permanent correction program will provide life insurance companies the ability to correct inadvertent MECs and, therefore, provide the tax benefits afforded life insurance consistent with the expectations of their policyholders.

### Why is a correction procedure necessary?

The need for a program allowing companies to correct inadvertent MECs has existed since 1988 when Congress enacted § 7702A. Historically, life insurance has been granted certain tax-favored characteristics, including the tax deferral of the inside build-up and the tax-free distribution of death benefit proceeds. In 1988, § 7702A was added to the Internal Revenue Code to create a new class of life insurance called modified endowment contracts. A life insurance contract becomes a MEC when it fails the 7-pay test as defined in § 7702A. Unlike pre-death distributions from a non-MEC, which are taxed on a return-of-premium first basis, distributions from a MEC (including policy loans) are generally taxed on an income-first basis.

Because § 7702A has proven to be very complex and quite difficult to administer, contracts have become MECs inadvertently. These unintentional MECs can arise for a variety of reasons, such as the early payment of an annual premium, errors in administering § 1035 exchanges, or incorrect processing of material changes or death benefit reductions. Other than the statutory provision that allows for the return of excess premium and earnings within 60 days after the contract anniversary, insurers did not have the ability to un-MEC a contract. However, in contrast, § 7702 (Definition of Life Insurance) has a built-in correction procedure under § 7702(f)(8) and never required the issuance of further correction procedures.

### The Initial Solution: Revenue Procedure 99-27

For several years, the insurance industry, through the ACLI, sought a program to allow for the correction of unintentional MECs. After several years of discussions, the IRS published Rev. Proc. 99-27 in May of 1999. For details of Rev. Proc. 99-27, please see the article in the August, 1999, issue of the PD Newsletter by Christian DesRochers and Brian King.

Rev. Proc. 99-27 turned out to be less than a wholly desirable solution for the insurance industry. In working with more than two dozen companies that did file under Rev. Proc. 99-27, as well as several companies that did not, we found five principal areas of concern and criticisms regarding the original correction program:

"Sunset Date" – Rev. Proc. 99-27 was a temporary procedure in that companies had a deadline of May 31, 2001, to file their submission to correct inadvertent MECs. In some cases, companies decided not to file because of this time limit. These companies felt they needed more time to find and understand their compliance problems, assemble the appropriate data and calculate the toll charges for the submission. Creating a permanent program without the deadlines imposed by Rev. Proc. 99-27 will provide companies adequate time to identify all inadvertent MECs, make the necessary administrative changes to prevent future inadvertent MECs and assemble a complete filing, satisfying all the reporting requirements imposed by the Revenue Procedure.

"One bite at the apple" – Insurers generally had one opportunity to submit all contracts for correction. This left little flexibility for companies to attack their problem in a "divide and conquer" fashion (e.g., one block of business at a time or one system platform at a time). It was all or nothing.

Limited scope – Most business-owned contracts (i.e., COLI) were not eligible for correction. Additionally, Rev. Proc. 99-27 created two eligibility tests—the 300% test and the 150% test which excluded certain contracts from correction.

> The 300% Test: In order for a contract to meet the requirements of the 300% test of section 4.03(2) of Rev. Proc. 99-27, the amount paid under the contract in any contract year of the testing period cannot exceed 300 percent of the 7-pay premium for the contract year.

> The 150% Test: Contracts will meet the requirements of the 150% test of section 4.03(3) of Rev. Proc. 99-27 if the cash surrender value of the contract does not exceed the contract holder's investment in the contract within 3 years after the issuance of the contract or the assumed 7-pay premium for the contract was not more than 150 percent of the correct 7-pay premium for the contract.

Both the 300% and 150% tests were intended to exclude investment rich contracts from correction under this revenue procedure. However, defining the particular parameters for identifying these types of contracts proved difficult. The insurance industry argued against both tests as they could render certain contracts with little or no investment orientation ineligible for correction. Conversely, certain investment-oriented contracts with significant amounts of excess premiums could pass these tests. In the end, however, companies were left with no means of correcting contracts falling into these two categories.

Reporting Requirements and "Toll Charge" Calculation – In order to generate the templates and compute the toll charge required to correct inadvertent MECs, companies needed to access significant amounts of historical policy level information that often proved difficult to obtain (e.g., the taxpayer identification number). For each contract included in the filing, companies were required to provide two reports, or templates. The first template detailed all historical premium transactions and 7-pay premiums. This information was used to identify the excess premium, or overage, which formed the basis for computing the "overage toll charge." The second template detailed the cash surrender value of the contract on each contract anniversary, along with all historical distributions (loans and withdrawals), including amounts reported to the policy owner as taxable. This information formed the basis for computing the "distribution toll charge." The second template also required a description of any material change that occurred as well as a description of the error that resulted in the inadvertent MEC.

For those companies filing a large number of contracts, significant programming efforts were needed in order to access and manipulate the historical information into the required formats for each template. Because the revenue procedure required a paper filing, companies generally filed between two and four pages for each contract included in their filing. Several companies filed closing agreements that included in excess of 10,000 pieces of paper!

Correcting Contracts: The final requirement a company must satisfy under Rev. Proc. 99-27 is that contracts must be corrected within 90 days after the execution of the closing agreement by either refunding excess premium (and earnings) or by increasing the death benefit. What sounds like a straightforward exercise can become quite complicated if your administration system continues to recognize these contracts as MECs, even after refunding the excess premium and earnings. Getting administrative systems to no longer administer these contracts as MECs has proven to be quite difficult for certain systems, particularly those systems that test for compliance from the original issue date each time a transaction is processed.

***What were the results of Rev. Proc. 99-27?***

Most companies in the insurance industry did not avail themselves of Rev. Proc. 99-27 and still had no process for correcting inadvertent MECs.

Between 50 and 75 companies filed closing agreements with the IRS. Even those companies were left with many contracts that could not be corrected because they were COLI contracts or failed one of the mathematical tests of Rev. Proc. 99-27.

Companies that filed closing agreements were not able to make a supplemental filing if additional MECs were identified after May 31, 2001, or after the original filing was submitted.

In general, the industry was seeking a procedure that provided what § 7702(f)(8) provides for contracts that fail the definition of life insurance. Section 7702(f)(8) provides for a correction procedure that is permanent, allows for multiple submissions over time as problems are discovered, and allows for the correction of virtually all contracts. Rev. Proc. 99-27 provided a stop-gap but fell short of providing a lasting solution.

***The Permanent Solution: Revenue Procedure 2001-42***

Two months after the expiration of Rev. Proc. 99-27, the IRS issued Rev. Proc. 2001-42. Even though Rev. Proc. 2001-42 carries over the burdensome reporting requirements and toll charge mechanism of Rev. Proc. 99-27, it has the following significant improvements:

Permanent procedure – Rev. Proc. 2001-42 is a permanent program, having no deadlines.

No limit on submissions – Rev. Proc. 2001-42 does not limit companies to a single filing request.

Expanded Scope – Rev. Proc. 2001-42 expands the scope of the correction program by allowing the correction of COLI contracts and eliminating the eligibility tests that contracts were required to satisfy under Rev. Proc. 99-27. Even without these tests, the IRS still has the authority to reject contracts it determines are part of a program to sell investment-oriented contracts or to be in clear violation of rules. This would include contracts that provide for paid-up future benefits after the payment of less than 7 level annual premiums. Companies also found the 300% eligibility rule especially frustrating.


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Other variations from Rev. Proc. 99-27 include the following:

- The deminimis overage earnings definition that applied only to contracts issued prior to January 1, 1999, now applies to all contracts.

- Although Rev. Proc. 99-27 did not differentiate between contracts in or out of the 7-pay test period, the IRS in practice did not require the refund of excess premium and earnings (or an increase in death benefits) on those contracts outside the 7-pay test period. Rev. Proc. 2001-42 explicitly clarifies this treatment: "Contracts within 90 days of the end of their seven-year test period on the date the closing agreement was executed do not require correction." Note that a toll charge must still be calculated and paid on these contracts.

Rev. Proc. 2001-42 recognizes that, despite the best efforts of life insurance companies and policy owners, some policies will become inadvertent MECs. By creating a permanent program, the IRS has created the opportunity for companies that were not able to take advantage of Rev. Proc. 99-27 to "cure" their inadvertent MECs. In addition, those companies that did file will now be able to supplement their filings to include virtually all inadvertent MECs. It is important to note that while the new revenue procedure does re-open the door for companies to bring their in force policies into compliance, the reporting requirements are still voluminous. As is well known by the companies that filed under the old revenue procedure, the cost in terms of necessary resources to meet the reporting requirements can be significant. At the same time, the new procedure addresses a deficiency that has existed in the MEC rules since their enactment by creating a program to "cure" errors—a benefit to insurance companies, policy holders, and the IRS.

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## *Society of Actuaries Announces Triennial Prize*

SCHAUMBURG, ILL. — The Society of Actuaries and its Committee on Life Insurance Company Expenses (CLICE) announces the inaugural $5,000 Arthur Pedoe Life Insurance Company Expense Study Award. The first award will be presented in 2004 for the best paper published between July 1, 2001 and June 30, 2004.

The purpose of the award is to increase awareness of the importance of expense analysis among company management by encouraging informative, high-caliber papers on the subject. The award will be offered once every three years for a paper that is judged to be the best paper on life insurance company expense analysis published by a suitable actuarial publication.

To be considered, a paper must be based on sound actuarial and accounting principles and should be of such caliber as to advance the state of the art of expense analysis and related life insurance financial information. Members of the CLICE will judge entries in conjunction with the editors of the *North American Actuarial Journal* (NAAJ). The CLICE reserves the right not to make an award in any period in which it does not consider any paper worthy of the award.

The award is named for Arthur Pedoe, an actuary who was well known for his studies of life insurance company expenses. Mr. Pedoe was a Fellow of the Institute of Actuaries, the Actuarial Society of America, the Canadian Institute of Actuaries, and the Society of Actuaries where he held the office of Vice President in 1958-59. He spoke frequently at Society meetings on trends in expenses and on the importance of controlling increases in expenses. For this purpose, he developed methods of calculating expected expenses to be compared with actual expenses. These methods were still in general use at his death in 1979.

The Society of Actuaries is a professional, educational, and research organization with more than 16,400 members who practice primarily in the fields of life and health insurance, pensions, employee benefits, and investments.

# 2002 Spring Program

It's not too soon to begin thinking about the 2002 Spring SOA Meeting.

This year's meeting will be held May 30th and 31st in Colorado Springs.
This will be an exciting meeting!

The Product Development Section Council has planned 16 sessions that are sure to be informative. So, that you may start preparing, the following is the list of sessions planned. The full descriptions will be published in the preliminary programs.

- Risk Management Seminar - 3 sessions:
    - Understanding and Managing Annuity Risks
    - Understanding and Managing Life Risks
    - Risk Management at the Corporate Level
- Underwriting and Mortality Seminar - 3 sessions:
    - Underwriting for Actuaries
    - Truth About Preferred Risk Product Design
    - Quick Issue Policies Take Off
- Implications of the New CSO Table
- Regulatory Developments Affecting New Products
- Critical Illness Issues
- Profit Measures in Pricing
- Dynamic Hedging
- Insurance for the Wealthy: Update on the Private Placement Market
- Illustration Actuary Workshop
- Medical Science and Life Insurance
- Using Financial Reinsurance to Enhance Risk-Adjusted Profits
- Hot Topics in the Individual Life and Annuity Market Place

The Section is also co-sponsoring the session Design and Pricing of Products for Internet Distribution with the Nontraditional Marketing Section taking the lead role.

In addition, on Friday, May 31st, the Council will be hosting a luncheon. The luncheon will include a short business meeting and table discussion on topics of industry significance.

The biggest challenge will be to find enough qualified speakers to fill these wonderful sessions. So …. if you are uniquely qualified to speak about one (or more) of these sessions and are willing to volunteer some of your time in Colorado Springs, please contact us. Also, even if you won't be able to speak and you know someone who'd be a great speaker for one of these sessions, let us know. Leave the recruiting to us!

Please send all your speaker requests to our Spring Program Representative, Kevin Howard at *kevin_howard@empiregeneral.com.*

We are also beginning to plan for the Annual Meeting. Please also send any ideas for sessions you may have to Kevin.

We are looking forward to
seeing all of you in Colorado Springs in May!

# *Regulators Respond to Industry "Innovation" Through Guideline AXXX*

***by Mary J. Bahna-Nolan***

It has been two years since XXX went into effect. Since that time, we have seen aggressiveness, creativity, and innovation in product design, as well as some blatant attempts to skirt the regulation. The regulators of the NAIC's Life and Health Actuarial Task Force (LHATF) have responded to this "innovation" through Actuarial Guideline AXXX, The Application of the Valuation of Life Insurance Policies Model Regulation (AXXX). This guideline is still in draft form. It is expected that the NAIC will adopt AXXX at its next meeting this March. The purpose of the guideline is to provide direction as to the application of XXX to various product designs. It is not meant to address all possible designs, but rather, to give guidance as to the intent of XXX.

AXXX is broken down into eight sections, with each section providing direction as how to apply XXX to a specific product design. While AXXX lacks full industry support, there is general support for the first seven sections. The eighth section specifically addresses universal life (UL) plans and is the area of much controversy. Each section is addressed below as well as some examples of product designs that fall under each section. The examples in the first six sections under AXXX tend to concentrate on premium rates, however, they are also applicable to premium loads and cost of insurance charges in universal life plans which can (and have been) manipulated to provide a type of no-lapse or secondary guarantee.

### *Section 1 - Increase Tied to an External Trigger*

These plans provide that a carrier may only increase premium rates (or loads in a universal life plan) if a certain external event occurs, such as the Treasury rate dropping below a certain level.

*Since the insurer does not have the unrestricted right to increase premiums, AXXX requires that companies reserve these plans as if the premium were guaranteed for the full level premium period.*

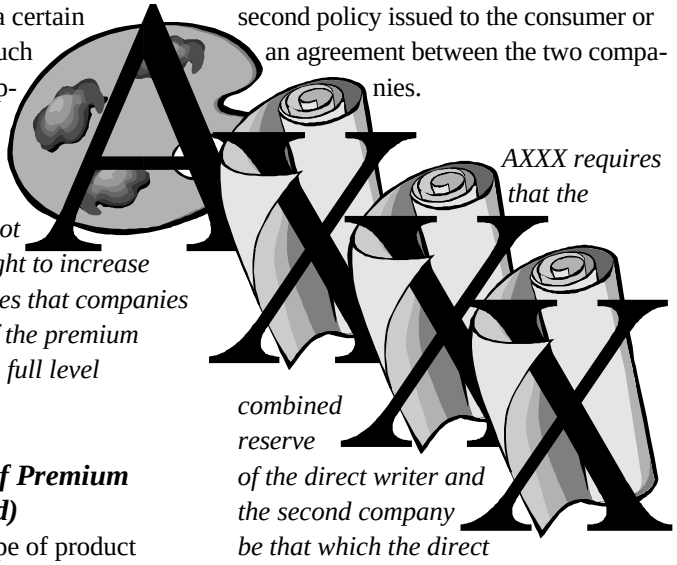
### *Section 2 - Refund of Premium (Partially Guaranteed)*

Carriers offering this type of product agree to refund the premium if the rates are increased during the projected level premium period. These designs generally include a specified window of time for the policyholder to exercise the option/right for the refund and if the option is exercised, the policy is generally cancelled. For universal life plans, the option is generally only available if the increase would otherwise cause the policy to lapse.

*Under these designs, the insurer's right to increase premiums in not unrestricted due to the requirement to provide additional benefits. AXXX states that companies must reserve for these types of policies over the entire level premium or secondary guarantee period.*

### *Section 3 - Affiliated Company Guarantee:*

These policies have an initial guaranteed level premium. After the initial premium guarantee period, the policyowner is protected against future premium increases. This protection is provided by a second company through reinsurance, a second policy issued to the consumer or an agreement between the two companies.




*AXXX requires that the combined reserve of the direct writer and the second company be that which the direct writer would have held absent the second company and based on the entire level premium period. The direct writing company may take reserve credits only if the agreement between it and the second company meets the requirements under the applicable reinsurance regulations.*

### *Section 4 - Refund of Premium (Fully Guaranteed)*

This design has high gross premiums, which are guaranteed. It also provides a cash value, dividend or premium refund after a certain period of time. The dividend or refund has the effect of creating a low "net guaranteed premium." In some designs, the amount of the refund or available cash value has equaled the sum of premiums paid after a certain period.

*AXXX will require that companies offering this type of design must use the net premiums (gross premium less amount of refund, dividend or cash value) in the reserve calculation.*

There was some concern in the industry that coinsurance allowances under

reinsurance treaties could be interpreted to fall under this category. AXXX treatment under this section is not intended to apply to coinsurance allowances under bona fied reinsurance agreements.

***Section 5 - Re-entry Plans:***
These plans have an initial rate or no lapse guarantee period. At the end of the initial rate guarantee period, the policyholder has the contractual right to re-enter to a second plan with no or little evidence of insurability. For some universal life plans, the right to re-enter occurs if the cash value falls below zero during the no lapse guarantee period (rather than only at the end of the period) and is available only if the stipulated premiums have been paid. The new or substitute plan generally provides an additional level premium period at specified favorable rates.

*AXXX will require that the initial re-entry periods and premiums be treated as a continuation of the initial guarantees. The original policy reserves are to be determined over the entire period; the reserves for the substitute policy are to be determined as if the coverage had been issued at the issue age and issue date of the original policy.*

***Section 6 - Level Net Reinsurance Premiums***
This section addresses at least one "innovative" approach to reinsurance that several reinsurance providers used in their treaties to ultimately shorten a guarantee. Essentially, in a case where the direct writers' premiums are guaranteed for X number of years, the reinsurance treaty provides level premiums on a current scale for X years but directly guarantees the premiums for a shorter number of years. If the reinsurer increases the premiums, it also agrees to increase the expense allowances such that the net payments for the direct writer remain unchanged.

*The regulators' view is that "the additional 'expense allowance' has no relationship to the expenses actually incurred by the direct writer in administering the reinsured policies." Therefore, under AXXX, the reinsurer, in their reserve calculation, needs to establish the reserve using an initial segment equal to the full level premium period and the valuation premiums should be level over that period.*

> *"Shadow account designs have become more prevalent over the past two years. These are similar to accumulation of premium designs."*

With respect to term insurance, most of the innovative designs were put in place to try to mask a partially guaranteed plan as guaranteed, as evidenced by the first five sections of AXXX. The introduction of these innovative designs has slowed over the past year. This slowdown is most likely attributable to AXXX and the market's demand for fully guaranteed plans.

With respect to universal life plans, there has been little "innovation" in design in response to XXX. Most of the new UL plans that companies introduced in 2001 were similar in design to their pre-XXX counterparts, and included both secondary guarantees and catch-up provisions. There has, however, been an increase in number of plans that incorporate shadow account designs.

Secondary Guarantees are generally one of two forms, Accumulation of Premium or Shadow Account. Both designs are subject to AXXX and the area of controversy surrounding this guideline. The Accumulation of Premium designs provide that a policy will stay inforce, regardless of the underlying cash value of the policy, as long as specified premiums have been paid. Secondary guarantees of this form are already clearly addressed under XXX.

Shadow account designs have become more prevalent over the past two years. These are similar to accumulation of premium designs. These plans generally allow a policy to stay inforce even if the calculated account value or cash surrender value becomes negative as long as the shadow account remains positive. The shadow account is generated in a manner similar to the account value but uses charges and/or credits more favorable than the guarantees in the basic/underlying policy.

Catch-up provisions are also prevalent. These are basically added to accumulation of premium types of secondary guarantees. They allow a policyowner to reinstate a secondary guarantee or move from a shorter secondary guarantee to a longer one by paying the difference between the cumulative required or "no lapse" premiums and the actual premiums paid to date.

The final two sections of AXXX specifically address catch-up provisions (Section 7) and secondary guarantees (Section 8).



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## Regulators Respond to Industry "Innovation" Through Guideline AXXX

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***Section 7 - Premium "Catch-Up" Provisions***

In general, this is the one area that AXXX provides some relief over a strict reading of XXX. Regardless of whether or not the policyowner is meeting the premium requirements to keep a secondary guarantee in force, reserves for plans which include "catch-up" provisions must be computed assuming the longest guarantee period is met. However, it then allows companies to proportionately reduce the basic and deficiency reserve amounts by any "catch-up" amount required on the valuation date in order to maintain the guarantee, not to be reduced below zero.

***Section 8 - Secondary Guarantee Requirements***

AXXX addresses both the accumulation of premium and shadow account designs. Under the guideline, any amounts already paid by the valuation date which may reduce the amount of future premiums necessary to satisfy the secondary guarantee requirements need to be added to the reserve. The total amount is capped by the Net Single Premium for the coverage on the valuation date. The latest draft, dated 12/6/01, does provide some additional relief for deficiency reserves and for surrender charges to be taken into consideration to reduce the amount of reserve.

This approach relies on actual premium payment history and some feel that incorporating the actual premium payments results in a modification to XXX and the UL Model Regulation. The UL Model Reg. calls for determination of premiums "at issue" and prepayments can not be determined at issue. If a policyholder prepays, all else being equal, their policy will have a higher cash surrender value than if they had paid annually. Since the obligation to keep the secondary guarantee in force requires less future premiums to be paid, AXXX requires that the company set up a higher reserve than if no prepayments had been made. This increased reserve is in addition to the "floor" established by the UL Model Reg. for highly funded policies.

This section lacks full industry support and is the area of much controversy. Some individuals feel that relying on actual premium payments is a modification to XXX and the UL Model Reg. in that it calls for determination of premiums "at issue" and prepayments can not be determined at issue. As such, some feel that such a change can not be accommodated through a guideline, but rather would require revising the regulations. Additionally, incorporating any pre-funding may materially change the required reserves for even the most modest secondary guarantees. Many companies priced these guarantees with a "good-faith" interpretation of XXX and, in many cases, reserved for them in a method agreed upon with the regulators.

For all but Section 8, the effective date for AXXX will be retroactive to the date XXX became effective in a particular state. The retroactivity may have a negative impact to companies and reinsurance providers that offered products or "guarantees" covered under one of these sections, especially if they took an aggressive interpretation to reserving under XXX.

The calculation approach defined under Section 8 will require many companies to reprice UL products, at least with respect to prepayments. Additionally, it will take companies some time to modify their systems to generate the proposed reserves, which incorporate actual premium payments. As a result, most of Section 8 will not be retroactive; the proposed effective date is currently January 1, 2003. The first two steps in the calculation described in Section 8 will be retroactive. These basically clarify how to define "minimum gross premiums" and "specified premiums" in XXX, but ignore actual premium payment history.

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# *The New 2001 CSO: Implications for Universal Life Plans*

***by Nancy Winings***

As the much awaited 2001 CSO Tables appear to be nearing completion, life insurance companies are beginning to explore the impact of these tables on their life insurance product designs. This article will investigate the effect the new mortality tables may have with respect to universal life products.

***Background***

Significantly lower mortality experience has emerged since the promulgation of the 1980 CSO minimum standard valuation morality tables. Because the lower mortality rates in the proposed 2001 CSO Tables generally result in lower statutory reserves, many companies are anxious to reflect the updated rates as soon as possible. For universal life plans, however, a lower statutory valuation standard can potentially limit the cost of insurance (COI) margin via a reduced cap on the maximum guaranteed COI rate. Additionally, the 2001 CSO Ultimate Tables also function as the maximum mortality standard for tax purposes. For single premium and limited pay UL plans whose focus is on minimizing the dollar of benefit per dollar of premium, the lower maximum mortality rates will increase that ratio.

As of this writing, the 2001 CSO Tables have yet to be adopted. References throughout this article to the 2001 CSO Tables pertain to the proposed valuation mortality rates based on proposed loadings applied to the valuation basic table (VBT). The VBT, the foundation of the 2001 CSO, was adopted by the NAIC in November, 2001.

If the state adopts the regulation (currently in draft form) permitting the use of the new tables, the earliest that companies may value statutory reserves using the 2001 CSO Tables for new life insurance contracts is January 1, 2003. Companies may elect to value statutory reserves on the new table on a plan-by-plan basis. Based on a January 1, 2003, effective date, the minimum statutory valuation standard for all new contracts issued after January 1, 2008, will be the 2001 CSO Tables.

Whereas the 1980 CSO Tables were constructed as attained age tables, the 2001 CSO Tables were constructed as select and ultimate tables with a select period of 25 years. Further, the terminal age of the 2001 CSO Table is 120. The terminal age of the 1980 CSO Table is 100.

The proposed regulation to permit the use of the 2001 CSO Tables allows companies to choose either the select and ultimate or ultimate structure to value statutory reserves. For the analysis in this article, the maximum COIs were assumed to be the rates from the 2001 CSO Ultimate Tables. Regardless of the structure of the mortality discount rates for reserve purposes, it appears that the maximum COIs must be based on the ultimate table because the prevailing tax tables will be the 2001 CSO Ultimate Tables. If the maximum COIs were based on the select and ultimate table, policyholders paying guideline premiums based on the ultimate table could overfund the contract.

The table below compares the 2001 CSO mortality rates to the 1980 CSO mortality rates for males and females, smokers and nonsmokers at selected attained ages.

**2001 CSO Smoker-Distinct Mortality (Ultimate) as a Percentage of the 1980 CSO Smoker-Distinct Mortality**

| Gender | Class | Attained Age | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | 25 | 35 | 45 | 55 | 65 | 75 | 85 | 95 |
| Male | NS | 64% | 64% | 70% | 70% | 73% | 68% | 76% | 81% |
| Male | SM | 76% | 76% | 73% | 70% | 73% | 68% | 80% | 88% |
| Female | NS | 46% | 61% | 57% | 76% | 82% | 71% | 63% | 61% |
| Female | SM | 60% | 79% | 68% | 97% | 107% | 97% | 83% | 88% |

**2001 CSO Smoker-Distinct Tables (Select & Ultimate) as a Percentage of the 1980 CSO Smoker-Distinct Tables**

| Gender | Class | Issue Age | Duration | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | 1 | 5 | 10 | 15 | 20 | 25 | 40 | 50 |
| Male | NS | 45 | 30% | 45% | 57% | 62% | 66% | 66% | 76% | 84% |
| | | 65 | 19% | 37% | 45% | 63% | 72% | 82% | N/A | N/A |
| Male | SM | 45 | 28% | 45% | 61% | 67% | 71% | 67% | 79% | 92% |
| | | 65 | 21% | 46% | 58% | 72% | 79% | 90% | N/A | N/A |
| Female | NS | 45 | 28% | 45% | 61% | 77% | 83% | 79% | 64% | 61% |
| | | 65 | 25% | 37% | 53% | 64% | 59% | 57% | N/A | N/A |
| Female | SM | 45 | 33% | 56% | 77% | 99% | 107% | 105% | 85% | 68% |
| | | 65 | 31% | 50% | 73% | 84% | 76% | 70% | N/A | N/A |



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## The New 2001 CSO: Implications for Universal Life Plans

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Observations of the mortality ratios include:

- Male smoker and nonsmoker ultimate mortality rates are roughly 25% to 30% lower than the 1980 CSO rates.
- Compared to the males, there is more variation by attained age in the percentage reduction of female nonsmoker ultimate mortality rates. The range of reductions is wider, too, from approximately 15% to 55%.
- Female smoker 2001 CSO ultimate mortality rates at certain attained ages are up to 10% greater than the corresponding 1980 CSO rates. Except at the older ages, the slope of the female smoker 2001 CSO mortality rates is steeper than the 1980 CSO rates. More steeply sloped mortality rates can produce higher reserves.

The terminal age of the valuation mortality table was extended from 100 to 120. With respect to the definition of life insurance (Internal Revenue Code Section 7702), the assumed maturity age for calculational purposes must fall between attained ages 95 and 100, inclusive. Some in the life insurance industry believe that it is unlikely that this rule will be changed in the near future due to other higher priorities within the IRS. For the analysis in this article, it was assumed that the maturity age of the sample contracts was 100 and that the DEFRA corridor factors were still applicable. If the maximum assumed maturity age increases, the IRS will likely revisit these factors.

### *Universal Life*

Many flexible premium universal life policy designs can be categorized according to planned premium patterns (annual pay versus limited pay). The analysis of the 2001 CSO Tables on annual pay plans is primarily of interest insofar as the maximum cost of insurance charges and statutory reserves are affected. The impact of the 2001 CSO Tables on reserves of limited pay plans is negligible; reductions in life insurance tax law limits as a result of the 2001 CSO Tables are of relatively more interest to limited pay plans.

### *Planned Premium Pattern: Annual*

To explore the potential impact of the 2001 CSO Tables on annual pay UL designs, a generic UL policy was constructed with product features and pricing assumptions consistent with industry norms. The COIs were structured to be somewhat "reverse select and ultimate." Many companies find it preferable to define larger COI margins in the early policy years in order to achieve profit targets and often achieve it through the COI charge.

It was assumed that the sample contracts satisfied the definition of life insurance via the Guideline Premium Test. Annual gross premiums were consistent with competitive target premiums available in the market today and well below the Section 7702 guideline premium limits.

Implications of the 2001 CSO Tables on the profitability resulting from changes to the valuation-based components of annual pay universal life plans include:

#### 1. Statutory Reserves

- Many UL contracts are written such that the maximum COI rates are the 1980 CSO rates. Replacing these rates with the 2001 CSO Ultimate, depending on the structure of the COI rates actually charged, may limit the scale of COI rates charged on a current basis. If no new loads are introduced in this case, the account value potentially will increase. For adequately funded contracts, the cash surrender value often begins to exceed the formula reserves after the first several policy years and thus become the reserve. Although the reserve pattern is highly dependent on the actual funding level, the CSO 2001 Tables may accelerate the point in time when the cash surrender value becomes the reserve.
- The almost universally lower maximum COI rates under the proposed 2001 CSO Tables relative to the 1980 CSO Tables can reduce the Guaranteed Maturity Premium (GMP) and, thus, the Guaranteed Maturity Fund (GMF). Therefore, the "r" factor, the ratio (not to exceed one) of the actual account value to the GMF, may increase. Coupling a potentially higher account value with a potentially lower GMF further increases the "r" factor. Everything else equal, higher "r" factors increase reserves.
- Irrespective of the "r" factor, the CRVM expense allowance decreases for most cases under the 2001 CSO Tables relative to the 1980 CSO. The increase in reserves as a result of lower expense allowances may be somewhat mitigated by a slightly faster amortization rate.
- The valuation mortality on the 2001 CSO basis is lower than the 1980 CSO basis for most cases. Without regard to the expense allowance or the increase in the "r' factor, these lower mortality rates may decrease reserves relative to the 1980 CSO basis roughly between 0% and 10%, varying by gender, issue age, risk class, and duration. The slightly higher "r" factor and lower expense allowances can offset the reserve decrease, particularly in the first few policy years.

A summary of the 2001 CSO terminal reserves for the sample plan as a percentage of the 1980 CSO terminal reserves is contained in the table below. Reserves are higher on a 2001 CSO select and ultimate basis as a percent of the 1980 CSO relative to the ultimate basis due to the difference in the mortality discount rates. For the sample contracts, the cash surrender values were identical across valuation tables because the actual COI rates were not limited by the lower maximum guaranteed rates.

#### 2. Maximum COI Rates

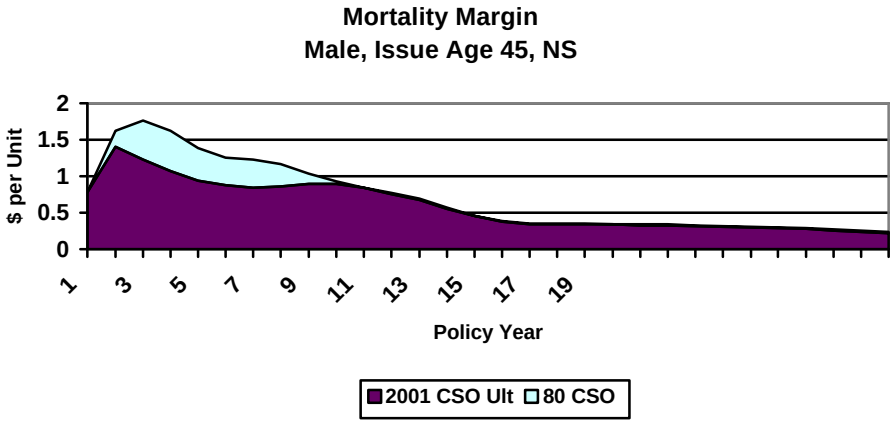
The reduction in the maximum mortality charges resulting from the introduction of the 2001 CSO Tables, particularly on reverse select and ultimate policy designs, can reduce mortality margins.

| 2001 CSO (Ultimate) UL Statutory Terminal Reserves (Per Unit In Force) as a Percentage of the 1980 CSO UL Statutory Terminal Reserves (Per Unit In Force) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Gender, Issue Age, Class | Ratio | End of Policy Year | | | | | | |
| | | 1 | 3 | 5 | 7 | 10 | 15 | 20 |
| Male, 45, NS | 2001 Ult/1980 | 113% | 101% | 99% | 98% | 99% | 100% | 100% |
| | 2001 S&U/1980 | 110% | 103% | 101% | 100% | 100% | 100% | 100% |
| Male, 65, NS | 2001 Ult/1980 | 107% | 101% | 100% | 100% | 100% | 100% | 100% |
| | 2001 S&U/1980 | 115% | 111% | 109% | 108% | 105% | 102% | 101% |
| Female, 45, NS | 2001 Ult/1980 | 106% | 101% | 99% | 99% | 100% | 100% | 100% |
| | 2001 S&U/1980 | 104% | 102% | 101% | 101% | 100% | 100% | 100% |
| Female, 65, NS | 2001 Ult/1980 | 105% | 101% | 100% | 100% | 100% | 100% | 100% |
| | 2001 S&U/1980 | 113% | 114% | 114% | 113% | 109% | 103% | 101% |
| Male, 45, SM | 2001 Ult/1980 | 110% | 101% | 99% | 99% | 100% | 100% | 100% |
| | 2001 S&U/1980 | 106% | 105% | 105% | 104% | 100% | 100% | 100% |
| Male, 65, SM | 2001 Ult/1980 | 105% | 100% | 99% | 99% | 100% | 100% | 100% |
| | 2001 S&U/1980 | 100% | 113% | 113% | 112% | 109% | 102% | 101% |
| Female, 45, SM | 2001 Ult/1980 | 94% | 99% | 100% | 100% | 100% | 100% | 100% |
| | 2001 S&U/1980 | 92% | 101% | 102% | 103% | 100% | 100% | 100% |
| Female, 65, SM | 2001 Ult/1980 | 105% | 101% | 100% | 100% | 100% | 100% | 100% |
| | 2001 S&U/1980 | 113% | 114% | 114% | 113% | 109% | 103% | 101% |

The graph at right illustrates a sample of the dollars of profit generated from the COI margin under two valuation bases for a male, issue age 45, nonsmoker within a highly reverse select and ultimate COI pattern.

For this model test cell, an update of the 1980 CSO Table to the 2001 CSO Ultimate Table results in a decrease (the profit margin under 1980 CSO minus the profit margin under 2001 CSO) in the after-tax profit margin of 2%.

The following independent changes to the policy load structure are examples of what would be required to produce the same after-tax profit margin (present value of after-tax profits divided by the present value of premiums) as under the 1980 CSO valuation table.




| Additional Loads Required To Achieve Base Case After-Tax Profit Margin (M, 45, NS) | |
|---|---|
| Policy Load Component | 2001 CSO Ultimate |
| Percent of Premium, *or* | 2% |
| Per Policy (per month), *or* | $8 |
| Annual Per Unit | $0.40 |

### 3. Surrender Charges

The promulgation of the 2001 CSO Tables will reduce the maximum per unit first year surrender charge allowed by the UL Model Regulation for most gender, issue age, and class combinations. Notable exceptions are at the older issue ages where the expense allowance is capped by formula.



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## The New 2001 CSO: Implications for Universal Life Plans

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| Maximum First Year Surrender Charge Per Unit | | | | | |
|---|---|---|---|---|---|
| Gender, Issue Age, Class | 1980 CSO | 2001 CSO Ultimate | Gender, Issue Age, Class | 1980 CSO | 2001 CSO Ultimate |
| M, 45, NS | 27.98 | 24.68 | F, 45, NS | 24.78 | 22.13 |
| M, 65, NS | 60.00 | 58.06 | F, 65, NS | 56.15 | 46.96 |
| M, 45, SM | 35.07 | 30.11 | F, 45, SM | 28.06 | 27.35 |
| M, 65, SM | 60.00 | 60.00 | F, 65, SM | 60.00 | 60.00 |

The table on on this page compares the maximum surrender charge per unit for the sample plan under both bases.

In addition to the reduction of the first year surrender charge, the new valuation rates define the minimum amortization rate at which the maximum surrender charge must decrease by policy year. A comparison of these minimum amortization rates across valuation mortality tables for a male, issue age 45, nonsmoker indicates that no appreciable difference emerges during the first fifteen policy years. Further, differences emerging in the later policy years are probably unimportant because most surrender charges for UL plans marketed today grade to zero over the first fifteen to 20 years.

The reduction in the maximum surrender charges was not reflected in the reserve analysis above. Lower surrender charges would serve to further accelerate the point at which the cash surrender value overtakes the formula reserve.

### 4. Tax Reserves

The UL Model Regulation defines the method for tax reserves as well as statutory reserves. However, whereas the company may choose which structure of the valuation table to use to calculate statutory reserves, the minimum valuation standard for tax purposes is declared by the IRS. Even though the 2001 CSO tables have not yet been promulgated, the 2001 CSO Ultimate Table is expected to be the prevailing tax table because it produces lower reserves when applied to a model of the life insurance industry.

Using the same adequately funded model plan as in the statutory reserve analysis, the tax reserves on the 2001 CSO basis can be higher than the 1980 CSO basis in the early durations and lower for a few years after that before the cash surrender value governs the reserve. Since lower tax reserves increase taxable income, one strategy companies might choose to follow is to wait until the end of the tax table phase-in period before implementing the new tables for tax purposes.

### *Planned Premium Pattern: Limited Pay*

Limited pay universal life plans share the same issues as annual pay plans with respect to maximum COI charges and surrender charges. A new minimum valuation standard would not be expected to significantly impact reserves of limited pay plans because the cash surrender value would generally exceed the calculated statutory reserve in the early policy durations. Whereas the definition of life insurance premium limits are not typically factors for annual pay designs, they play a significant role in limited pay designs.

An analysis of the 2001 CSO impact on the profitability of a sample plan from the valuation morality-based components is described below.

### 1. Guideline Premiums

As with tax reserves, the maximum mortality rates for definition of life insurance purposes is expected to be the 2001 CSO Ultimate Table. Guideline Level Premiums (GLP) and Guideline Single Premiums (GSP) for a generic UL design can range from 10% to 30% lower than under the 1980 CSO Tables, depending on the policy load structure. Reductions are smaller for female smokers.

The table below summarizes the ratio of 2001 CSO GLPs and GSPs to the 1980 CSO GLPs and GSPs for a generic UL design ($6/month per policy and 5% of premium load). A comparison of Section 7702(A) 7-Pay premiums is also included.

The net amount at risk increases for many cases under the 2001 CSO for a single premium design. If no changes are made to the policy design, the increase in profits from the COI charges collected on the higher net amount at risk is somewhat mitigated by any potential reduction in the cap on maximum mortality charges imposed by the 2001 CSO relative to the 1980 CSO.

### 2. Maximum COI Rates

The net effect on profitability of the lower gross premiums and lower COI rates on a model test plan where the gross premium is the GSP is summarized in the table above for selected test cells.

Profit streams in the present value measures were discounted by the after-tax net investment earnings rate. Reasons for the change in the profitability from the 1980 CSO basis to the 2001 CSO basis include:

| 2001 CSO Ultimate Guideline Premium Limits as a Percentage of the 1980 CSO Guideline Premium Limits | | | | | | | |
|---|---|---|---|---|---|---|---|
| Gender, Issue Age, Class | GSP | GLP | MEC | Gender, Issue Age, Class | GSP | GLP | MEC |
| M, 45, NS | 85% | 85% | 89% | F, 45, NS | 86% | 86% | 89% |
| M, 65, NS | 89% | 83% | 90% | F, 65, NS | 88% | 83% | 90% |
| M, 45, SM | 85% | 83% | 88% | F, 45, SM | 97% | 97% | 98% |
| M, 65, SM | 89% | 81% | 89% | F, 65, SM | 99% | 97% | 99% |



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| Statutory Valuation Basis | Male, 45, NS | | Male, 65, NS | |
|---|---|---|---|---|
| | PV Profit (Per Unit) | Profit Margin | PV Profit (Per Unit) | Profit Margin |
| 1980 CSO | $9.60 | 4.5% | $21.08 | 9.9% |
| 2001 CSO S&U | $8.69 | 4.8% | $24.78 | 13.7% |
| 2001 CSO Ultimate | $8.69 | 4.8% | $24.70 | 13.7% |

- Reductions in the dollars of profit from the interest margin resulting from the new cap on the reverse select and ultimate COI rates offset slightly by increases in the dollars of profit from the mortality margin due to increases in the net amount at risk. Larger offsets occur at older issue ages for this sample case because of the larger percentage increase in the net amount at risk;
- A decrease in the dollars of premium tax resulting from the lower gross premium; and
- Lower percent of premium surrender charge income resulting from the lower gross premium.

It is worth noting that the profit margin may increase (as a result of lower gross premiums) while the actual dollars of profit may decrease.

Independent changes in the policy load structure were determined such that the 1980 CSO present value of profits was maintained.

In summary

- The 2001 CSO Tables may reduce projected account values of reverse select and ultimate plan designs through lower caps on the maximum COI rates.
- Plans funded at (lower) tax law limits may develop lower account values unless loads, COIs, or credited interest rates are reconfigured;
- Higher reserves on annual pay plans may not by themselves require a change in the plan design. While 2001 CSO reserves may be higher on a percentage basis than 1980 CSO reserves during the early durations, the increase in dollars of reserves is somewhat limited due to the fact that reserves for moderately funded annual pay plans are typically lower in the early policy years anyway.
- Surrender income may be reduced slightly if existing surrender charges are above the new maximum limits.
- To offset potential lost income on COI charges of UL plans with highly reverse select and ultimate COI patterns, companies may consider implementing a per unit charge that varies by gender, issue age, risk class and policy duration.
- Companies may elect to postpone implementing the CSO 2001 Tables on a tax basis until the latest phase-in date for tax purposes.
- Many UL plans are constructed to satisfy the definition of life insurance via the Guideline Premium Test. However, the increase in the net amount at risk as a result of the 2001 CSO Tables for plans that satisfy the definition of life insurance via the Cash Value Accumulation Test (CVAT) may to be less at some attained ages than the increase in the net amount at risk for Guideline Premium Test plans. As a result, companies may begin to consider the CVAT design more often.

| Additional Loads Required To Achieve 1980 CSO Present Value of Profits (M, 45, NS) | |
|---|---|
| Policy Load Component | 2001 CSO Ultimate |
| Percent of Premium, *or* | 1% |
| Per Policy (per month), *or* | $2 |
| Annual Per Unit | $0.20 |

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## Structured Creativity

*continued from page 3*

defining the customer's critical requirements. It is used to select new markets, define new products, track post-launch market behavior, and leverage market intelligence efforts. In other words, it is the front end of a multi-disciplinary, structured product development process.

It is no secret that some new products fail to meet sales expectations, and others never make it to market. In some cases, a pet idea is advanced, even in the face of negative market research. In other cases of failure, market size is overestimated, a product is incorrectly positioned, or unexpected competition emerges. If a product never makes it to market, it may be because there was insufficient information to warrant the product development investment, or because of unexpected showstoppers. Finally, many companies are so busy with "me-too" responses and product fixes that they miss new or established market opportunities. It all boils down to a lack of information—information that would have been gathered if the DFSS/i framework was used.



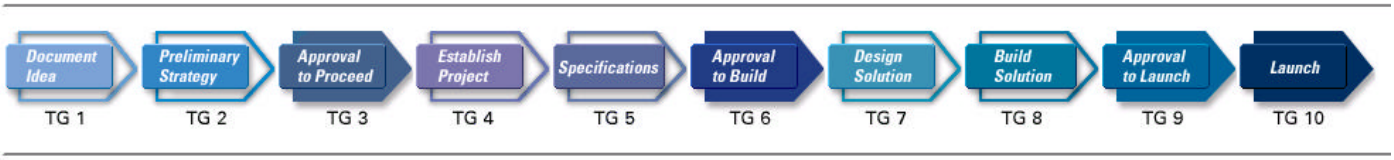
continued on page 18

## Structured Creativity

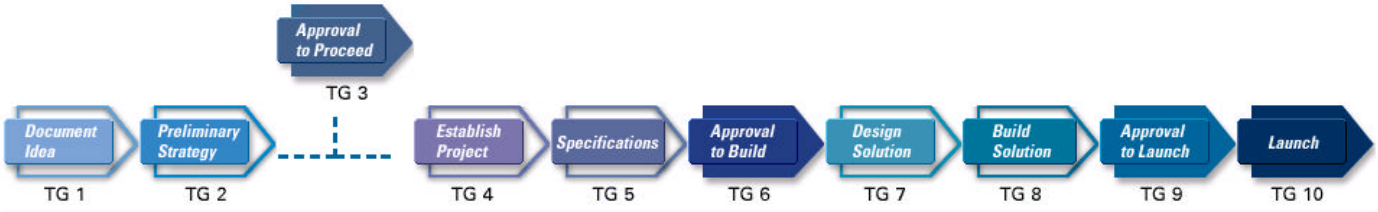
*continued from page 17*

### *The 10 Tollgates Process*

One of GE's businesses has developed the "10 Tollgates" approach to new product innovation, based on the steps in the DFSS/i and general DFSS processes. This approach incorporates a roadmap for new product innovation and development, a centralized intranet-based toolbox for execution—including task lists, resources, required sign-offs, Six Sigma tools and more—to support the roadmap, as well as incentives for associates who use it.




The following diagram is a screenshot from the first page of the 10 Tollgates Intranet site:




**Tollgate 3: Approval to Procede** Preliminary Project Pitch including Cost/Benefit Analysis (PAR), Project Plan and Resource Requirements

When a user selects a step in the roadmap, they are provided with the required tasks by functional area, relevant Sx sigma and other tools, and a list of resources to consult for assistance in completing the step. The following diagram illustrates this relatively simple infrastructure:

The 10 Tollgates approach balances the voice of the customer, business needs and product design constraints. Customer needs, distribution needs and the insurer's business needs are all assessed. In the world of Six Sigma, these needs are called "Critical to

| Phase | Objective | Actions | Desired Outcome |
|---|---|---|---|
| **Define** | Identify the market opportunity and general product scope based on existing organizational knowledge and secondary research. | • Develop hypothesis<br>• Gather organizational knowledge<br>• Go/No-Go decision | Bring focus and efficiency to the rest of the process. |
| **Measure** | Focused data gathering in the context of the product framework. Translate the voice of the customer into measurable CTQs. | • Develop product framework<br>• Fill in data gaps<br>• Establish business, customer and channel CTQs | Emphasis on CTQs leads to data driven decisions and focuses limited resources. |
| **Analyze** | Analyze data to generate a concept design and define the most attractive product opportunity. | • Analyze data to define product<br>• Financial modeling<br>• Establish scorecard | Avoid analysis paralysis! |
| **Design** | Evaluate impact of alternative solutions. Develop detailed design for most attractive product approach. | • Assess technology impact<br>• Establish product scorecard<br>• Develop pricing strategy | Remember that design is iterative, but also finite! |
| **Verify** | Validate that the product opportunity is real. Verify the concept design and transition to implementation. | • Reach Go/No-Go decision<br>• Final abatement of risk as needed<br>• Hand off to execution team | Documentation of process and outcomes to date is critical. Have the courage to make a No-Go decision. |

Quality" requirements or CTQs. CTQs must be measurable and actionable. Product requirements are defined and product specifications created within the parameters set by the CTQs and the insurer's capabilities. Six Sigma uses customer "Scorecards" to measure performance—keeping in mind that customers can be internal as well as external.

***DMAIC – The Five Phases of DFSS***

The DFSS framework can be broken into five phases:

***Using DFSS/i to Develop a "Virtual" Insurance Product***

Insource Ltd. recently used the DFSS/i framework to develop the first virtual insurance product in Canada. In this case, a distributor wanted to drive product design and wanted a new solution for an established market. This required a fundamental shift in the product development paradigm—usually it is the manufacturer that funds the design and development of a new product. Since the carrier was not going to be central to the product offering, this case required process design as well as product design, and risk control would be critical.

In the Define phase, it emerged that what the distributor wanted was a paradox: a unique, commodity product. In order to achieve this, we had to use processes to differentiate the product, rather than unique benefits or pricing.

Next, we gathered the CTQs of the various stakeholders. The distributor wanted a unique, proprietary product that would help them increase their sales to the small business market. The insurer wanted risk-free income, and the market was asking for competitive pricing in a simple, high-end product. A 10-year term product was selected as the best solution.

There was some discussion about the distributor's ability to deliver policyholder service and other functions, but a capability analysis clearly showed that the distributor should stick to their core competency—namely distribution. In this case, we had to find a third party organization to handle the underwriting, claims processing, policy service, and administration.

The final outcome was a "virtual" insurance model, where every function was optimized by allowing each participant in the model to focus on their core competencies and with the insurer acting as a fronting company for a 100% reinsured product.

The final analysis prior to the implementation hand-off, which employed a Six Sigma tool called the "Failure Mode Error Analysis," revealed a contract-related risk-management hurdle that had never been brought to the team's attention. Having caught this issue prior to launch, it was fairly easily solved, at little cost in terms of time to market and resources.

***Conclusion***

Six Sigma, and in particular DFSS and now the 10 Tollgates process, bring structure and discipline to the creativity required for successful product innovation and development at GE. In an environment of constant change and competitive pressure, the use of a consistent, data-driven methodology for product development decisions and execution are key to insurance company responsiveness and flexibility.

*Eva Goldstein is a Senior Consultant with Insource Ltd., an insurance and financial services-focused consulting company owned by GE. She can be reached at* eva.goldstein@insource.ca.

## Annual Meeting Speakers to Thank:

***Deanne Osgood***

***Mary J. Bahna-Nolan***

***John M. Fenton***

***Anne Andersen***

***Roger Harbin***

***Douglas C. Doll***

***Steven P. Habegger***

***Novian Junus***

***Ken McCullum***

***Jennifer Orzell***

***Sheldon Summers***

***Douglas L. Robbins***

***Michael Palace***

***David Cook***

***Cary Lakenbach***

***Michael Barsky***

***Keith A. Dall***

***Nancy M. Kenneally***

***Michael S. Sakoulas***

***David Braun***

***Charles Gilbert***

***Tim Hill***

***Tim Ruark***

***Richard Bergstrom***

***Anna Hart***

***Wayne Wagner***

***Dave Kam***

# The 5th Annual Annuity Conference

*Three great associations. One great conference. April 10-12, 2002*

*Contemporary Resort*
*Orlando, FL*

Don't miss the 5th annual Annuity Conference, where you will learn about everyday issues that affect the annuity and investment professional. This year's conference kicks off with a dynamic general session that provides strategies for success in a low interest rate environment. The concurrent sessions are a great way to find out about the latest developments in the annuities with a variety of topics to choose from. Plus, you'll have many opportunities to network with your peers and other industry leaders.

***About the associations:***
LOMA is committed to a business partnership with its worldwide members in the insurance and financial services industry to improve their management and operations through quality employee development, research, information sharing, and related products and services. Founded in 1924, the association's membership roster boasts over 1,000 member companies in 70 countries.

LIMRA International, Inc., was founded in 1916 to support and enhance the marketing functions of life insurance companies through original research, as well as products and services based on that research. Today, LIMRA is the premier marketing research organization in the financial services industry with more than 700 members—life/health insurance companies and financial services companies in nearly 60 countries.

Registered with the National Association of State Boards of Accountancy as a sponsor of continuing professional education on the National Registry of CPE Sponsors. State boards of accountancy have final authority on the acceptance of individual courses. Complaints regarding sponsors may be addressed to NASBA, 380 Lexington Ave., New York, NY 10168-0002, 212/490-3868.

## *Session Schedule*

***Wednesday, April 10*** - Reception
***Thursday, April 11*** - 8:30 a.m. - 10.15 a.m.

### General Session
**Product/Market Strategies in Low Interest Rate/Poor Equity Environment**

10:30 a.m. – 11:45 a.m.

The following sessions are particularly relevant to Product Development Actuaries.

1.1 SPDA Product Features/Innovations
Learn about the implications of electronic order entry, appless processing, and Web transaction processing for the annuity business. Explored will be the positive implications, as well as some potential downsides, from the perspectives of the insurance carrier, the broker/dealer and the investment professional.

Concurrent Session
(Select One)

3.1 Annuity Suitability (PD)
*Moderator: Kerry Guerkink, CLU, CEBS, CHFC, Minnesota Life Insurance Co.*
*James Doyle, Info-One/ the VARDS Report*
*Maureen Joy Dziewt, Northwestern Mutual Life Insurance Company*
*Judith Hasenhauer, Blazzard, Grodd and Hasenhauer, P.C.*
The regulatory environment has left us with important questions to deal with: When is an annuity the "right" product to sell and when is it not suitable? Are there circumstances when other products, such as life insurance, might be the better answer, or vice versa? Does a suitability obligation lie solely with the distributor or does the manufacturing entity carry a responsibility?

3.2 Unbundled VA Features: Are They Right for Your Company? (PD)
*Moderator: Eric Shawn Hendersen, FSA, MAAA, Nationwide Financial Merle Gehman, Morgan Stanley*
Is unbundling ahead of its time, or is now the time to act? Discover why some companies have chosen to unbundle most of their VA features, while others have

chosen to stay with the bundled approach. Hear the pros and cons from a distributor's point of view.

3.3 VA Death Benefits (PD)
*Moderator: Julia Raven, Merrill Lynch Insurance Group*
*Michael W. Pado, FSA, MBA, MAAA, AXA Corporate Solutions Life Reinsurance Company*
*Timothy C. Pfeifer, FSA, MAAA, Milliman USA*
We all know that a death benefit is a key distinguishing element of a variable annuity. Hear about recent trends in death benefit designs, including earnings related death benefits. Also covered will be issues and approaches for managing death benefit risk.

***Thursday, April 11***
Concurrent Session
5.1 EIA's: Can You Afford to Ignore? (PD)
*Moderator: Joel A. Prough, FSA, MAAA, Conseco*
*Noel J. Abkemeier, FSA, Milliman USA*
*Jack Marrion, The Advantage Group*
Although still relatively new, Equity Indexed Annuities have established a solid position in insurers' annuity offerings, which cannot be ignored. Learn about what has brought this sales success and gain insight into the pricing, design, and risk management steps that help make EIAs a financial success.

5.3 Variable Immediate Annuities: Design Update 2002 (PD)
*Moderator: Robert K. Leach, FSA, American Skandia Life Assuance Corporation*
*Timothy C. Pfeifer, FSA, Milliman USA*
Variable immediate annuities have recently gained increased attention in the financial and retirement planning marketplace as demand for these products seems to be increasing substantially. Find out how insurance companies are using product innovation to capitalize on growing demand, starting with a review of features being offered in variable payout products and insight into emerging product design trends. Learn about how insurance companies can use guarantees to stabilize expected streams of monthly income while maintaining prospects for continuing upside growth in monthly benefits, and how to manage risk exposures created by VIAs.

9:45 a.m. – 10:45 a.m.

Concurrent Session
6.1 MVAs: Standalone and VA Subaccounts

6.2 Short CDSC Products
Competitive landscapes, marketing, product development, underlying guarantees, and distribution channels may vary from what we are accustomed to seeing. Our panelists will share some of their findings on international markets.

## *Register Now*

***Online:*** *(www.loma.org)*

***Sign up by March 11 and save $75!***

***LOMA, LIMRA and SOA Members***
By March 11: $725 Nonmembers $995
After March 11: $800 Nonmembers $1,070

***Hotel Reservations***
The hotel rate is $229.00 per night single/double, plus 11% tax. Concierge rooms are $315.00 plus 11% tax, based on availability. There is a $25.00 per night plus 11% tax charge for a third adult in the room. These rates are available from April 5 to April 16, 2002. **Reservations must be made by March 11, 2002 to receive this rate.** The hotel requires that all reservations be guaranteed by credit card or check. To guarantee, the hotel requires first night's deposit. Cancellation must be made five days prior to the arrival date to avoid a charge of one night's room and tax. For more information, or to make reservations, please call the Group Reservation Office at Disney's Contemporary Resort at 407/824-3869. The hotel address is:

***Disney's Contemporary Resort, 4600 North World Drive***
***P.O. Box 10,000***
***Lake Buena Vista, FL 32830***
***Phone 407/824-3869, Guest Fax Line 407/824-3539***

***Flight Reservations***
WorldWide Travel Services offers meeting attendees maximum savings on airfares. To obtain these savings, complete the form found at *www.limra.com/pdf/airfare.pdf* and fax it to 860-298-4186.

***Car Rental***
Hertz is the official car rental agency for this meeting. Reserve a car by calling Hertz at 800-654-2240. Refer to meeting discount number CV# 01230005.

***Attire***
The dress code for this conference is business casual.

***For more information:***
**James Huffman, FLMI, ACS, LOMA**
770/984-6446
*huffmanj@loma.org*

**Eric T. Sondergeld, LIMRA International**
860/285-7754
*ESondergeld@limra.com*

***John Riley, Society of Actuaries***
*847/706-3543*
*jriley@soa.org*

***The Society of Actuaries Product Development Section Presents:***

# *Tying Together Profitability Measures*

***SEMINAR NUMBER: 173***

**Wednesday, June 12**

8:00 a.m. - 8:30 a.m. Registration & Continental Breakfast
8:30 a.m. - 4:15 p.m. Meeting
12:00 p.m. - 1:00 p.m. Group Luncheon

Profit measures such as profit margin, return on assets (ROA), statutory return on investment (ROI or IRR), return on equity (ROE), Breakeven Year, and Surplus Strain have been used to make decisions concerning new products. Does your CFO understand these measures? Are you able to explain them to your CFO or Chief Marketing Officer? What impact do these measures have on a company's GAAP financial statements? How do these traditional measures relate to new measures such as Economic Value Added (EVA) analysis or Risk Adjusted Return on Capital (RAROC) measures?

The presenters will address:

- Establishing common language for balance sheet, income statement, and pricing components
- Impacts of pricing measures and methods on a company's GAAP financial statements
- Methods to explain pricing results to senior executives
- Emerging measures such as EVA and RAROC

***Topics***

1) Identify Various Pricing Measures
   a) Definition
   b) Differences
   c) Appropriateness for differing products
   d) Discounting considerations

2) How Profitability Emerges on Statutory and GAAP Statements
   a) Profile by product type
   b) Examples of single issue blocks
   c) Examples of continuing and growing production
   d) Highlight areas of statements impacted
3) Embedded Value/Economic Value/Risk Adjusted Return on Capital
   a) Definitions
   b) Discuss sensitivities and interpretations
   c) Demonstrate the previous blocks of policies in this context
4) "Tying It All Together"
   a) Presenters summarize the seminar and bring it all together
   b) Question and answer session

***Format***

Lecture with small group informal discussions

***Educational Objectives***

At the conclusion of this seminar, attendees:

- Understand the impact that long-term profitability measures have on the annual profitability shown in financial statements and ways to bring common understanding to pricing actuaries and financial officers.

***Target Audience***

- Practicing product development actuaries
- Pre-fellows seeking professional development credits
- Financial reporting actuaries interested in understanding the measures used in product development

***Level of Difficulty***

The seminar is designed for participants with moderate to substantial experience.

***Professional Development Credit***

This seminar has been approved for 6 units of Professional Development credit. For further information regarding the Professional Development requirement, please access the SOA Web site at (*www.soa.org*).

***Presenters***
**Noel J. Abkemeier, FSA, MAAA**
*Consulting Actuary*
Milliman USA

**Duncan Briggs, ASA, MAAA**
*Principal*
Tillinghast - Towers Perrin

**Michelle D. Smith, FSA, MAAA**
*Consultant*
Tillinghast - Towers Perrin

***2nd Annual Product Development Actuary Symposium, June 13 - 14***
Westin O'Hare — Rosemont, IL
(Sponsored by the Product Development, NTM and Reinsurance Sections)

The Product Development Actuary Symposium will provide a forum for marketing and product development-related practitioners to discuss, debate and question strategies of industry experts and creative thinkers.

## WHAT PARTICIPANTS OF THE 2001 SYMPOSIUM SAID....

- *This symposium was great. The presenters were excellent overall. The topics were pertinent. I would be interested in a similar symposium every year.*
- *Overall, the break out sessions were informative.*
- *General sessions were educational (better than most SOA general sessions).*
- *Good technical overview of annuity and life product development.*
- *Great concept! I love the idea of breaking out Product Development; I would certainly come again.*
- *Great content and focus on PD as its importance continues to increase.*
- *Too wide a disparity on the level of sessions. The Life Modeling was extremely simplistic; the reinsurance session (financial reinsurance) was way too complex.*
- *Great Meeting!*
- *Don't miss out this year!*

## ONE FINAL NOTE....

INTRODUCTION TO LIFE REINSURANCE, JUNE 11-12 AT THE DOUBLETREE O'HARE - ROSEMONT, IL (SPONSORED BY THE REINSURANCE SECTION)

This seminar provides an interactive approach to learning the basics of life reinsurance. All the speakers are seasoned reinsurance professionals with years of experience. From basic reinsurance structures, to legal and regulatory aspects, to accounting considerations, the seminar participant will enjoy a thoughtful, interactive two days of learning the essential building blocks of life reinsurance.

For more complete information, visit *www.soa.org* under *meeting/seminars*

## U.S. GAAP for Life Insurers

For experienced professionals who use U.S. GAAP in the life insurance industry, U.S. GAAP for Life Insurers is the most up-to-date and comprehensive reference book that consolidates the practices and policies of GAAP surrounding life insurance products.

U.S. GAAP offers perspectives on the objectives of GAAP and shows the application of GAAP to various insurance products, such as: traditional life, deferred annuities, variable and other non-fixed products, income-paying annuities, individual health, credit insurance, group contracts and more.

U.S. GAAP extends beyond the U.S. border to multi-national companies and/or companies interested in accessing the U.S. capital market.

U.S. GAAP for Life Insurers is available from the SOA for $100 in North America. For ordering information, please contact the SOA Books and Publications Department at 847-706-3526 from 8:00 a.m. to 5:00 p.m. central time.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