

**DETERMINING THE  
“ACTUARIAL PRESENT VALUE” OF CERTAIN “ADDITIONAL BENEFITS”  
UNDER TREAS. REG. SECTION 1.401(a)(9)-6, Q&A-12**

**I. Introduction**

Section 401(a)(9) of the Internal Revenue Code (the “Code”) sets forth certain lifetime and after-death minimum distribution requirements that apply generally to qualified plans under Code section 401(a), tax-sheltered annuity contracts and custodial accounts under Code sections 403(b)(1) and 403(b)(7), individual retirement accounts and annuity contracts under Code sections 408(a) and 408(b), and eligible deferred compensation plans under Code section 457(b). In addition, the after-death minimum distribution requirements under Code section 401(a)(9) apply to Roth IRAs under code section 408A. Final regulations addressing the application of these minimum distribution requirements to individual account plans were issued in 2002, and final regulations addressing the application of these requirements to annuity contracts were issued in June 2004.

The regulations provide generally that in the case of an individual account, if a minimum distribution is required for a calendar year, the amount of the required distribution for the year is equal to the quotient obtained by dividing the account balance as of the last valuation date in the immediately preceding calendar year by the applicable distribution period determined under the regulations.<sup>1</sup> The regulations also provide generally in Treas. Reg. section 1.401(a)(9)-6, Q&A-12, that prior to the date annuity payments commence under an annuity contract, the contract is treated for purposes of Code section 401(a)(9) as an individual account for which the account balance is treated as the sum of the “dollar amount credited” to the employee or beneficiary under the contract plus the “actuarial present value” of “any additional benefits” that will be provided under the contract. The actuarial present value of an additional benefit must be determined using “reasonable actuarial assumptions.”

This new requirement that the actuarial present value of certain benefits must be taken into account in computing required minimum distributions (or “RMDs”) under a deferred annuity contract represents a significant departure from how such distributions were required to be computed in the past. Many questions exist regarding the application of Q&A-12 and, unfortunately, no guidance has been issued to date that addresses any of these issues. In light of this uncertainty, the RMD Working Group of the Taxation Section of the Society of Actuaries has prepared this paper in an effort to provide annuity issuers with some helpful discussion of Q&A-12.<sup>2</sup>

This paper considers the types of benefits that are covered by Q&A-12, certain assumptions that might reasonably be used in determining the actuarial present value of

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<sup>1</sup> Treas. Reg. section 1.401(a)(9)-5, Q&A-1.

<sup>2</sup> The views expressed in this paper reflect the collective views of the participants of the RMD Working Group (identified at the end of this document), and not necessarily the views of any individual participant, their affiliated organization, the Taxation Section of the Society of Actuaries, or the Society of Actuaries.

additional benefits provided under an annuity contract, and certain methods of computing the actuarial present value of additional benefits. As discussed below, in many cases, there may be a number of different assumptions and methods for computing the actuarial present value of a benefit that are reasonable. Thus, the actuarial present value of any additional benefits likely will fall within a range of acceptable values, rather than be a single value.

The RMD Working Group is comfortable that the approaches described herein for computing the actuarial present value of additional benefits can be reasonable for purposes of applying Q&A-12. It should be noted, however, that companies should consult their tax advisors regarding the application of Q&A-12 to their particular annuity products. In addition, this discussion should not be viewed as an authoritative interpretation of Q&A-12 and should be considered in light of any future guidance and all the facts and circumstances.

## II. Treas. Reg. section 1.401(a)(9)-6, Q&A12

Treas. Reg. section 1.401(a)(9)-6, Q&A-12, states that prior to the date that an annuity contract under an individual account plan is “annuitized,” the interest of an employee or beneficiary under that contract is treated as an individual account for purposes of Code section 401(a)(9). For purposes of applying the individual account rules set forth in the regulations under Code section 401(a)(9), the entire interest under the annuity contract as of December 31 of the relevant valuation calendar year is treated as the account balance for the valuation calendar year. The “entire interest” under an annuity contract is:

the dollar amount credited to the employee or beneficiary under the contract plus the actuarial present value of any additional benefits (such as survivor benefits in excess of the dollar amount credited to the employee or beneficiary) that will be provided under the contract.<sup>3</sup>

Also, the actuarial present value of any additional benefits described in Q&A-12 are to be determined using “reasonable actuarial assumptions, including reasonable assumptions as to future distributions, and without regard to an individual's health.”<sup>4</sup>

With respect to this requirement that the dollar amount credited under the contract must be adjusted for the actuarial present value of any additional benefits under the contract, the preamble to the regulations states that the Internal Revenue Service (the “IRS”) and the Treasury Department believe that it is generally appropriate to reflect the value of additional benefits under an annuity contract, “just as the fair market value of all assets generally must be reflected in valuing an account balance under a defined contribution plan.”<sup>5</sup>

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<sup>3</sup> Treas. Reg. Section 1.401(a)(9)-6, Q&A-12(b).

<sup>4</sup> *Id.*

<sup>5</sup> 69 Fed. Reg. 114, 33292 (June 15, 2004).

Q&A-12 provides the following three special rules under which additional benefits may be disregarded for purposes of applying the actuarial present value adjustment requirement to a deferred annuity contract.

1. ***The 120 percent exclusion.*** The actuarial present value of any additional benefits provided under an annuity contract may be disregarded if “the sum of the dollar amount credited to the employee or beneficiary under the contract and the actuarial present value of the additional benefits” (*i.e.*, the “entire interest” under the contract) is no more than 120 percent of the dollar amount credited to the employee or beneficiary under the contract and the contract provides only for the following additional benefits:
  - a. additional benefits that, in the case of a distribution, are reduced by an amount sufficient to ensure that the ratio of such sum to the dollar amount credited does not increase as a result of the distribution (“Pro-Rata Reduction” benefits),<sup>6</sup> and
  - b. an additional benefit that is the right to receive a final payment upon death that does not exceed the excess of the premiums paid less the amount of prior distributions (a “return of premium” or “ROP” benefit).
2. ***The ROP benefit exclusion.*** If the only additional benefit provided under the contract is a ROP benefit (*i.e.*, the right to receive a final payment upon death that does not exceed the excess of the premiums paid less the amount of prior distributions), it may be disregarded regardless of its value in relation to the dollar amount credited to the employee or beneficiary under the contract.
3. ***The IRS guidance exclusion.*** The IRS may issue revenue rulings, notices, or other guidance published in the Internal Revenue Bulletin that provides additional guidance on additional benefits that may be disregarded. As of the date of this paper, no such guidance has been issued.

The regulations provide two examples illustrating an acceptable method of determining the actuarial present value of additional benefits that are in the form of a guaranteed death benefit and an ROP benefit.<sup>7</sup>

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<sup>6</sup> The term “pro-rata reduction” benefit is often used in the annuity industry to refer to a benefit that, in the case of a distribution, is reduced by a percentage equal to the percentage reduction in the account value under the contract as a result of the distribution. For purposes of Q&A-12, a Pro-Rata Reduction benefit generally is a benefit the actuarial present value of which is reduced as a result of a distribution by a percentage that is equal to or greater than the resulting percentage reduction in the amount credited under the contract.

<sup>7</sup> See Treas. Reg. section 1.401(a)(9)-6, Q&A-12(d).

### III. The scope of the application of Q&A-12

#### A. In general

By its terms, Q&A-12 applies to an annuity contract under an individual account plan that has not been “annuitized,” *i.e.*, it applies for the period prior to the date annuity payments commence under the contract. Hence, the actuarial present value adjustment requirement does not apply to an annuity contract for periods after annuity payments have commenced under the contract. Q&A-12 refers to special rules elsewhere in the regulations that apply for purposes of determining the required minimum distribution for the calendar year in which annuity payments commence.

In addition, Q&A-12 applies for purposes of determining required minimum distributions to the individual for whose benefit the annuity contract is purchased and the individual’s beneficiary. In particular, Q&A-12 indicates that it applies for purposes of satisfying Code section 401(a)(9) with respect to the employee’s or beneficiary’s entire interest under an annuity contract for the period prior to the date annuity payments commence. Hence, the actuarial present value adjustment requirement must be applied prior to annuitization to determine (1) lifetime required minimum distributions to the employee commencing on the individual’s “required beginning date” within the meaning of Code section 401(a)(9)(C) (except that distributions from a Roth IRA are not required during the owner’s lifetime), and (2) required minimum distributions to the employee’s beneficiary after the employee’s death.

Also, Q&A-12 is not expressly limited to any specific type of annuity contract, and thus, as discussed further below, potentially applies to all types of contracts, *i.e.*, fixed annuity contracts and variable annuity contracts, including equity indexed annuity contracts, contracts with a market value adjustment provision, and other types of deferred annuity contracts. As a practical matter, given the design of deferred annuity contracts currently in the market, it might be more likely that additional benefits in excess of the amount credited to the employee or beneficiary will be provided under a variable annuity contract than a fixed annuity contract.

#### B. Certain benefits excluded from Q&A-12

As described above, Q&A-12 provides three special rules under which additional benefits may be disregarded for purposes of applying the actuarial present value adjustment requirement to a deferred annuity contract: (1) the 120 percent exclusion, (2) the ROP benefit exclusion, and (3) the IRS guidance exclusion. The RMD Working Group noted several issues regarding the 120 percent exclusion, discussed below.

##### 1. Additional benefits covered by the 120 percent exclusion

As expressed in Q&A-12(c)(1), the 120 percent exclusion applies where the contract provides only for a Pro-Rata-Reduction benefit *and* an ROP benefit. One could read the 120 percent exclusion as applying only to a contract that provides for *both* a Pro-Rata Reduction benefit and an ROP benefit. However, the RMD Working Group is not aware of any reason why

it would be necessary for a contract to provide for an ROP benefit in order to qualify for the exclusion. In addition, Q&A-12(d), example 1, applies the 120 percent exclusion in the case of a contract that provides a Pro-Rata Reduction benefit “which is the only additional benefit available under the contract.” Hence, absent further guidance to the contrary, it appears that the better interpretation of Q&A-12(c)(1) is that it identifies Pro-Rata-Reduction benefits and ROP benefits as the only types of benefits that a contract may provide under the 120 percent exclusion, *i.e.*, the exclusion can apply to a contract providing only a Pro-Rata-Reduction benefit without an ROP benefit.

## 2. Treatment of “dollar-for-dollar” benefits as non-increasing benefits

It is unclear whether the 120 percent exclusion can apply to an additional benefit that, in the case of a distribution, is reduced by an amount equal to the dollar amount of the distribution (a “dollar-for-dollar” benefit). In particular, Q&A-12 states that the actuarial present value of an additional benefit provided under an annuity contract may be disregarded if the sum of the dollar amount credited to the employee or beneficiary under the contract and the actuarial present value of the additional benefits (*i.e.*, the entire interest in the contract) is no more than 120 percent of the dollar amount credited to the employee or beneficiary under the contract and the contract provides only for Pro-Rata Reduction benefits and an ROP benefit. A Pro-Rata Reduction benefit is an additional benefit that, in the case of a distribution from the contract, is reduced by an amount sufficient to ensure that the ratio of such sum (*i.e.*, the entire interest) to the dollar amount credited does not increase as a result of the distribution. Stated differently, a distribution from an annuity contract with a Pro-Rata Reduction benefit will reduce the benefit by a percentage that is equal to or greater than the percentage by which the entire interest under the contract is reduced as a result of the distribution.<sup>8</sup> Uncertainty about whether the 120 percent exclusion can apply to an annuity contract providing a dollar-for-dollar benefit exists because depending upon the facts and circumstances at any time, a distribution from an annuity contract with a dollar-for-dollar benefit could reduce the benefit at that time by a percentage that is less than, equal to, or greater than the percentage reduction in the entire interest under the contract as a result of the distribution.

One interpretation of the 120 percent exclusion is that if, at the time the required minimum distribution for a year is to be calculated, a distribution would reduce the dollar-for-dollar benefit by a percentage that is equal to or greater than the necessary percentage, the benefit should be treated as a Pro-Rata Reduction benefit at that time. Under this interpretation, the contract could provide “only” for the types of benefits permitted under the 120 percent exclusion for the year, and the exclusion could apply to the benefits for the year. The exclusion

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<sup>8</sup> The preamble to the regulations describes the 120 percent exclusion generally as applying when there is a pro-rata reduction “in the additional benefits for any withdrawal.” 69 Fed. Reg. 114, 33292 (June 15, 2004). The RMD Working Group questioned whether it could be possible for a distribution to result in a percentage reduction in the amount credited under the contract that is greater than the percentage reduction in the *entire interest* under the contract and, at the same time, is less than or equal to the resulting percentage reduction in the *amount* of the additional benefits. The RMD Working Group did not consider whether the 120 percent exclusion should apply in such a case.

would not apply for a year if, at the time the required minimum distribution for the year is to be calculated, a distribution would reduce the dollar-for-dollar benefit by a percentage that is less than the resulting percentage reduction in the entire interest under the contract.

Another interpretation of this exclusion is that because it is possible under certain facts and circumstances for a distribution to reduce a dollar-for-dollar benefit by a percentage that is less than the resulting percentage reduction in the amount credited under the contract, the benefit can never qualify as a Pro-Rata Reduction benefit. Under this interpretation, the contract would never provide “only” the types of benefits permitted under the 120 exclusion, and the exclusion could never apply to a contract with a dollar-for-dollar benefit.

This issue of whether the 120 percent exclusion can apply to an annuity contract providing a dollar-for-dollar benefit is a legal question that is beyond the scope of this paper.

### **C. Certain benefits subject to Q&A-12**

One question concerns what types of benefits under an annuity contract should be treated as “additional benefits” that are subject to the actuarial present value adjustment requirement. Q&A-12 states that the requirement applies to “any additional benefits (such as survivor benefits in excess of the dollar amount credited to the employee or beneficiary) that will be provided under the contract.” It is clear from this language that the IRS and Treasury Department contemplated that the adjustment would apply to at least certain types of death benefits provided under annuity contracts prior to the date annuity payments commence.

In this regard, the two examples set forth in Q&A-12 involve a death benefit treated as an additional benefit. The benefit involved is a death benefit until the end of the calendar year in which the owner attains age 84 equal to the greater of the current “notional account value,” *i.e.*, the dollar amount credited to the owner under the contract, and the largest notional account value at any previous policy anniversary reduced proportionally for subsequent partial distributions (a “high water mark” benefit). Presumably, the actuarial present value adjustment requirement also applies to other types of annuity death benefits that are payable upon the employee’s death and are in excess of the amount credited to the employee or beneficiary under the contract, such as (1) a death benefit that generally pays the greater of the contract’s cash value on the date of death and the net premiums paid for the contract plus interest at a specified rate (a “roll-up” benefit), and (2) a death benefit that generally pays a specified percentage of the “gain” in the contract on the date of death, *i.e.*, a percentage of the excess of the cash value over the unrecovered premiums paid under the contract (a “percentage of gain” or “EEDB” benefit).

The actuarial present value adjustment requirement in Q&A-12 applies by its terms to “any” additional benefits, and thus is not limited to death benefits. However, neither Q&A-12, the examples thereunder, nor the preamble to the regulations provide any indication as to the types of other benefits that should be covered by this requirement. The language in Q&A-12 suggests that at least benefits that at any time could provide amounts payable under the contract that are in excess of the amounts credited under the contract at that time might be treated as additional benefits for this purpose. Hence, Q&A-12 presumably applies to certain lifetime

benefits provided to the employee, such as (1) guaranteed minimum income benefits providing the owner the ability to annuitize the contract at a certain age and be guaranteed annuity payments at a minimum level regardless of the contract's actual cash value, (2) guaranteed minimum withdrawal benefits providing the owner with the right to withdraw a certain specified percentage of his or her contributions for a specified duration, and (3) guaranteed minimum accumulation benefits providing the owner with a guaranteed minimum cash value at certain pre-determined and specified times.<sup>9</sup>

How Q&A-12 applies to a deferred annuity contract will differ depending upon the benefits provided under the contract. Annuity contract issuers should consider whether and how Q&A-12 applies to such provisions as equity indexed adjustment ("EIA") provisions, market value adjustment ("MVA") guarantees under a contract, waiver of premium provisions, and waiver of surrender charge provisions. More generally, issuers will need to consider whether a provision, feature, or guarantee under a deferred annuity contract might constitute either (1) part of the "dollar amount credited to the employee or beneficiary under the contract" within the meaning of Q&A-12, or (2) an "additional benefit" in excess of the "dollar amount credited." In applying Q&A-12 to a deferred annuity contract, the issuer should consider the following questions:

1. Does a contract provision, feature, or guarantee constitute part of the "dollar amount credited to the employee or beneficiary under the contract" within the meaning of Q&A-12?
2. If the provision, feature, or guarantee, constitutes part of the "dollar amount credited," should the "dollar amount credited" include only positive adjustments, or both positive and negative adjustments (if any)?
3. If the provision, feature, or guarantee does not constitute part of the "dollar amount credited," does it constitute an "additional benefit" that is in excess of the "dollar amount credited" within the meaning of Q&A-12?
4. If the provision, feature, or guarantee constitutes an "additional benefit," can a negative actuarial present value (if any) reduce the "dollar amount credited" for this purpose?

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<sup>9</sup> Proposed regulations issued in 2002 provided that prior to the date annuity payments commence under an annuity contract, the entire interest in the contract for purposes of section 401(a)(9) is the dollar amount credited to the employee or beneficiary under the contract plus the "actuarial value" of "any other benefits" that will be provided under the contract. Prop. Treas. Reg. section 1.401(a)(9)-6, Q&A-12. Commentators argued that "other benefits" should not include lifetime benefits provided to the employee and that final regulations should clarify that the actuarial value adjustment requirement applies only to certain types of death benefits. It is important to note that the final regulations are not expressly limited or clarified in this respect.

In considering whether a position on these questions is reasonable, the company should consider what arguments can be made in support and in opposition of the position, and the relative strengths and weaknesses of these arguments.

#### **IV. Methods of computing the actuarial present value of additional benefits**

Companies may deem it appropriate to reflect the future cost of additional benefits as an offset to the benefit payments. In that way, the present value of the benefit more accurately reflects the market value. Companies may consider it reasonable to only reflect explicit benefit charges. If so, there would be no recognition of the component of the mortality and expense (“M&E”) charge or other fees that reflects the cost of providing the benefit, and the present value of future charges for standard, non-elective benefits would be zero.

Alternatively, companies may reflect the full cost of the benefit, including components of M&E and other charges that could be eliminated if the benefit did not exist. Pricing results and reinsurance costs may be considered in determining the appropriate implicit fee level.

Many companies will plan on calculating the actuarial present value of additional benefits (less charges) on a policy by policy, or seriatim, basis. In this regard, the calculation would be done as of the valuation date over the reasonable benefit period (discussed in Assumption section). Companies should consider whether it is appropriate to reflect in the calculation expected decrements from lapse and mortality, as well as expected utilization of withdrawals and annuitizations. This calculation will thus determine the dollar amount of additional benefits as of the valuation date.

As an alternative to the seriatim approach, companies may also consider using a factor approach. Instead of performing the actuarial present value calculation for each policy separately, companies using the factor approach would calculate the value for a set of representative policies and then translate the value to the individual policy via a factor applied to a representative base (based on the parameters applicable for the policy). A factor approach may be desirable for companies with a large block of policies, where the time/effort required to calculate results for all policies may be onerous and beyond the capabilities of their administrative system.

In utilizing the factor approach, companies should make their own determination that the factor approach develops results that are reasonable and within an acceptable tolerance level, as compared to undertaking the seriatim approach. As such, this may require increasing the number of parameters that are utilized. A list of possible parameters that may be considered include the following (this is not intended to be a complete list):

1. specific rider feature,
2. combination of rider features,
3. issue date,

4. issue age,
5. duration from issue, and
6. excess of guaranteed benefit amount over account value (often referred to as “in-the-moneyness”)

Another consideration is the base upon which the factor is expressed. Possible candidates include the following (although not intended to be a complete list):

1. account balance,
2. benefit base, and
3. relative in-the-moneyness.

Finally, companies may wish to consider situations where it is not necessary to calculate the actuarial present value of additional benefits. In some cases, it may be evident from the benefits that there is no chance that the actuarial present value of the benefits can exceed the 20 percent threshold under the 120 percent exclusion, discussed above. It might be reasonable for companies to take the position that developing seriatim actuarial calculations in this situation is not necessary.

## **V. Reasonable actuarial assumptions**

### **A. In general**

As indicated above, the explicit directive of Q&A-12 regarding assumptions for determining the actuarial present value of additional benefits is limited to the following three conditions: (1) that actuarial assumptions be reasonable, (2) that reasonable assumptions as to future distributions be included, and (3) that assumptions disregard an individual’s health.

The numerical examples in Q&A-12 use assumptions as to rates of mortality, account value growth, interest discount, and withdrawal. Those assumptions or, in the case of the account value growth rate, the methodology underlying the assumption, may generally be considered a safe harbor subject to the following caveats.

1. Companies may use any set of assumptions meeting the three criteria above; the safe harbor should not be considered restrictive in determining reasonableness.
2. The assumptions deemed to be safe harbors today may become unreasonable over time, and so obsolete as safe harbors. For example, a substantial increase in market interest rates might make the discount rate assumption obsolete.

The concept of reasonableness is familiar to actuaries. For the purposes of determining the actuarial present value of additional benefits, “best estimates” of future experience, without additional adjustments for adverse experience or other reasons, are appropriate. Historical experience and pricing factors will often be appropriate. To the extent that the assumptions used differ materially from either past experience or pricing assumptions, the actuary should be cognizant of, and have a rationale for, those differences.

Some assumptions, such as mortality rates and interest discount rates, will likely apply universally across all qualified contracts. Companies may decide to base some assumptions on the particular characteristics of individual contracts. For example, a company may decide to use dynamic withdrawal assumptions for a Guaranteed Withdrawal Benefit, where the owner’s assumed withdrawal utilization rate is correlated to the excess, if any, of the withdrawal guarantee over the account value. As another example, a company may determine the assumed account value growth rate based on the actual subaccount allocations in a variable annuity contract. The growth rate might be highest if the account value is comprised primarily of equities, and lowest if comprised of money market and fixed account investments. However, companies may also deem appropriate the use of universal assumptions for all contracts.

In some cases, the impact of varying an assumption will depend on the interplay of various contract benefits and provisions. For example, increasing a withdrawal assumption may increase the value of the withdrawal benefit but decrease the value of the guaranteed death benefit. Increasing the assumed rates of withdrawal may therefore increase the present value of benefits on some contracts and decrease it on others.

## **B. Assumption Categories**

1. ***Interest Discount.*** Since the present value of a benefit must reflect the time value of money, projected future benefit amounts must be discounted at an interest rate. The assumption should reflect the accumulation rate at which a reasonable person would be indifferent between a benefit today and an accumulated future benefit. Some may base the rate on an index, such as Moody’s Corporate Bond Index, either on a pre-tax or post-tax basis.

The IRS examples use a 5% discount rate. Some companies may choose to adopt that rate. However, the extent to which that rate is reasonable may change as market interest rates increase or decrease.

2. ***Mortality.*** Several sources may be considered, such as pricing rates or company or industry experience. Other sources for the determination of reasonable rates may also be available. The IRS example uses the mortality table in Rev. Rul. 2001-62 and, as such, companies may consider that table a safe harbor.
3. ***Account Value Growth.*** Companies may use best estimates based on the yield characteristics of assets. For variable contracts, companies may consider a weighted composite of historical rates of return on the asset classes (i.e., equity classes, bond classes, mutual funds, etc.) underlying the account values.

Companies may choose an assumed growth rate for all contracts based on the composite asset allocation of all affected contracts, or may customize an assumed growth rate for each contract based on that contract's asset allocation.

The IRS example uses the fixed account guarantee rate of 2%. Companies may consider whether such an approach is reasonable for their block of business.

4. ***Withdrawals (partial liquidations).*** Assumed rates may differ based on elected benefits (perhaps higher withdrawal rates for contracts with guaranteed withdrawal benefits). Dynamic assumptions may be appropriate for these benefits more so than for others.

The IRS example assumed an annual withdrawal equal to the prior year-end account value divided by the life expectancy factor used for determining the Required Minimum Distribution. To the extent that the RMD will reflect an actuarial present value of additional benefits, the assumed withdrawals will be less than the actual RMD for the contract. However, this may be a reasonable assumption to use given the difficulty of projecting more exact RMD amounts based on the contract's entire interest (i.e., based on a value that includes the present value of additional benefits).

Projecting more exact future RMD amounts, based on a projection of the present value of additional benefits, is difficult because future RMD distributions are based on future projected benefits which, in turn, are a function of projected future RMD distributions. The recursive nature of the future RMD/future benefit interplay is difficult to resolve in the present value calculations.

5. ***Lapse (full liquidations).*** Although the IRS example does not include contract lapse rates, it is reasonable to include them in determining a present value of additional benefits. One of the few directives for assumptions is that "reasonable assumptions as to future distributions" be used. It is generally reasonable to conclude that some future distributions will involve the full liquidation of the contract.
6. ***Annuitization.*** An assumption as to the rate of annuitization will be more significant if the contract includes a guaranteed income benefit, or any other benefit that comes into play only upon annuitization. Absent such a benefit, companies may choose to ignore this assumption, perhaps including it as a component of the lapse assumption.
7. ***Other Assumptions.*** Companies may require other assumptions because of the nature of their benefits. For example, a morbidity rate is required to value the present value of a long term care benefit. Consideration of the nature of the benefit, reinsurance rates, and company or industry experience may all be appropriate in determining appropriate assumptions.

### C. Examples

As mentioned above, the regulations provide two examples illustrating an acceptable method of determining the actuarial present value of additional benefits that are in the form of a guaranteed death benefit and an ROP benefit. These examples use the policy-by-policy, or seriatim, approach to calculate the actuarial present values. Attached as Appendix A is a copy of the examples set forth in the regulations.

Also attached are examples developed by the RMD Working Group illustrating the use of different assumptions under the policy-by-policy approach to calculate the actuarial present value with respect to the following provisions, features, and guarantees under a deferred annuity contract:

1. a guaranteed minimum death benefit (“GMDB”) until the end of the calendar year in which the contract owner attains the age of 84 equal to the greater of the current account value and the largest account value at any previous policy anniversary reduced proportionally for subsequent partial distributions (Appendix B);
2. a guaranteed minimum account balance (“GMAB”) at the end of the calendar year in which the contract owner attains the age of 84 (Appendix C);
3. a guaranteed minimum income benefit (“GMIB”) that provides the owner an annuitization guarantee prior to the attainment of age 84 and guaranteeing annuity payments at a minimum level regardless of the contract’s actual account value; and a GMIB with a GMDB (Appendix D);
4. a guaranteed minimum withdrawal benefit (“GMWB”) providing the right to withdraw up to a certain specified percentage of contributions annually regardless of the contract’s actual account value (Appendix E);
5. an earnings enhancement death benefit (“EEDB”) providing a guaranteed death benefit equal to the sum of the current account value plus a percentage of the “earnings” under the contract, *i.e.*, a percentage of the excess of the cash value over the unrecovered premiums paid under the contract (Appendix F);
6. a “2-tiered” fixed annuity under which the amount that is applied to a settlement option as of the maturity date equals the “upper tier” account value, rather than the “lower tier” account value upon which death benefits and surrender benefits are based (Appendix G);
7. a “Persistency Bonus” provision under which the account value is increased by a percentage of account value (Appendix H);

8. an “Annuity Bonus” provision under which the account value that is applied to provide annuity payments as of the contract’s maturity date is increased by a percentage of account value (Appendix I); and
9. an equity indexed annuity contract (Appendix J).

It is important to note that the RMD Working Group prepared these examples assuming that the provisions, features, or guarantees involved are “additional benefits” that are subject to Q&A-12. The examples are not intended to create an inference that Q&A-12 applies in all the cases addressed in the examples. As discussed above, it is unclear whether certain provisions, features, and guarantees under a deferred annuity contract (such as equity indexed provisions like those in the example set forth in Appendix J) constitute “additional benefits” within the meaning of Q&A-12. However, the RMD Working Group is comfortable that assuming the provisions, features, and guarantees involved in the examples are “additional benefits” for this purpose, and absent further guidance under Q&A-12, the actuarial assumptions reflected in each example should be reasonable under the facts and circumstances assumed in the example. The RMD Working Group acknowledges that different assumptions also might be reasonable.

## **VI. Conclusion**

As discussed above, the new requirement in Q&A-12 that the actuarial present value of certain benefits must be taken into account in computing required minimum distributions under a deferred annuity contract represents a significant departure from how such distributions were required to be computed in the past. Many questions exist regarding the application of Q&A-12 and, unfortunately, no guidance has been issued to date that addresses any of these issues.

This paper is intended to provide annuity issuers with some helpful discussion of the types of benefits that are covered by Q&A-12, certain assumptions that might reasonably be used in determining the actuarial present value of additional benefits provided under an annuity contract, and certain methods of computing the actuarial present value of additional benefits. In many cases, there may be a number of different assumptions and methods for computing the actuarial present value of a benefit that are reasonable. Thus, the actuarial present value of any additional benefits likely will fall within a range of acceptable values, rather than be a single value.

The RMD Working Group is comfortable that the approaches described herein for computing the actuarial present value of additional benefits can be reasonable for purposes of applying Q&A-12. It should be noted, however, that companies should consult their tax advisors regarding the application of Q&A-12 to their particular annuity products. In addition, this discussion should not be viewed as an authoritative interpretation of Q&A-12 and should be considered in light of any future guidance and all the facts and circumstances.

Attachments

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## APPENDIX A

### **TEXT OF EXAMPLES SET FORTH IN TREAS. REG. SECTION 1.401(a)(9)-6, Q&A-12(d), ILLUSTRATING AN ACCEPTABLE METHOD OF DETERMINING THE ACTUARIAL PRESENT VALUE OF CERTAIN ADDITIONAL BENEFITS**

(d) Examples. The following examples, which use a 5 percent interest rate and the Mortality Table provided in Rev. Rul. 2001-62 (2001-2 C.B. 632), illustrate the application of the rules in this A-12:

Example 1. (i) G is the owner of a variable annuity contract (Contract S) under an individual account plan which has not been annuitized. Contract S provides a death benefit until the end of the calendar year in which the owner attains the age of 84 equal to the greater of the current Contract S notional account value (dollar amount credited to G under the contract) and the largest notional account value at any previous policy anniversary reduced proportionally for subsequent partial distributions (High Water Mark). Contract S provides a death benefit in calendar years after the calendar year in which the owner attains age 84 equal to the current notional account value. Contract S provides that assets within the contract may be invested in a Fixed Account at a guaranteed rate of 2 percent. Contract S provides no other additional benefits.

(ii) At the end of 2008, when G has an attained age of 78 and 9 months the notional account value of Contract S (after the distribution for 2008 of 4.93% of the notional account value as of December 31, 2007) is \$550,000, and the High Water Mark, before adjustment for any withdrawals from Contract S in 2008 is \$1,000,000. Thus, Contract S will provide additional benefits (i.e. the death benefits in excess of the notional account value) through 2014, the year S turns 84. The actuarial present value of these additional benefits at the end of 2008 is determined to be \$84,300 (15 percent of the notional account value). In making this determination, the following assumptions are made: on the average, deaths occur mid-year; the investment return on his notional account value is 2 percent per annum; and minimum required distributions (determined without regard to additional benefits under the Contract S) are made at the end of each year. The following table summarizes the actuarial methodology used in determining the actuarial present value of the additional benefit.

Year	Death Benefit During Year	End-of-Year Notional Account Before Withdrawal	Average Notional Account	Withdrawal at End of Year	End-of-Year Notional Account After Withdrawal
2008	\$1,000,000				\$550,000
2009	\$ 950,739 <sup>1</sup>	\$561,000 <sup>2</sup>	\$555,500 <sup>3</sup>	\$28,205 <sup>4</sup>	\$532,795
2010	\$ 901,983	\$543,451	\$538,123	\$28,492	\$514,959
2011	\$ 853,749	\$525,258	\$520,109	\$28,769	\$496,490
2012	\$ 806,053	\$506,419	\$501,454	\$29,034	\$477,385
2013	\$ 758,916	\$486,933	\$482,159	\$29,287	\$457,645
2014	\$ 712,356	\$466,798	\$462,222	\$29,525	\$437,273

Year	Survivorship to Start of Year	Interest Discount to End of 2008	Mortality Rate During Year	Discounted Additional Benefits Within Year
2008				
2009	1.00000	.97590	.04426 <sup>5</sup>	\$17,070
2010	.95574	.92943 <sup>6</sup>	.04946	\$15,987 <sup>7</sup>
2011	.90847 <sup>8</sup>	.88517	.05519	\$14,807
2012	.85833	.84302	.06146	\$13,546
2013	.80558	.80288	.06788	\$12,150
2014	.75090	.76464	.07477	\$10,739
				----- \$84,300

1 \$1,000,000 death benefit reduced 4.93 percent for withdrawal during 2008.

2. Notional account value at end of prior year (after distribution) increased by 2 percent return for year.

3 Average of \$550,000 notional account value at end of prior year (after distribution) and \$561,000 notional account value at end of current year (before distribution).

4. December 31, 2008 notional account (before distribution) divided by uniform lifetime table age 79 factor of 19.5.

5 One-quarter age 78 rate plus three-quarters age 79 rate.

6 Five percent discounted 18 months  $(1.05^{-(1.5)})$ .

7 Blended age 79/age 80 mortality rate (.04946) multiplied by the \$363,860 excess of death benefit over the average notional account value (901,983 less 538,123) multiplied by .95574 probability of survivorship to the start of 2010 multiplied by 18 month interest discount of .92943.

8 Survivorship to start of preceding year (.95574) multiplied by probability of survivorship during prior year  $(1 - .04946)$ .

(iii) Because Contract S provides that, in the case of a distribution, the value of the additional death benefit (which is the only additional benefit available under the contract) is reduced by an amount that is at least proportional to the reduction in the notional account value and, at age 78 and 9 months, the sum of the notional account value (dollar amount credited to the employee under the contract) and the actuarial present value of the additional death benefit is no more than 120 percent of the notional

account value, the exclusion under paragraph (c)(2) of this A-12 is applicable for 2009. Therefore, for purposes of applying the rules in §1.401(a)(9)-5, the entire interest under Contract S may be determined as the notional account value (i.e. without regard to the additional death benefit).

Example 2. (i) The facts are the same as in Example 1 except that the notional account value is \$450,000 at the end of 2008. In this instance, the actuarial present value of the death benefit in excess of the notional account value in 2008 is determined to be \$108,669 (24 percent of the notional account value). The following table summarizes the actuarial methodology used in determining the actuarial present value of the additional benefit.

Year	Death Benefit During Year	End-of-Year Notional Account Before Withdrawal	Average Notional Account	Withdrawal at End of Year	End-of-Year Notional Account After Withdrawal
2008	\$1,000,000				\$450,000
2009	\$ 950,739	\$459,000	\$454,500	\$23,077	\$435,923
2010	\$ 901,983	\$444,642	\$440,282	\$23,311	\$421,330
2011	\$ 853,749	\$429,757	\$425,543	\$23,538	\$406,219
2012	\$ 806,053	\$414,343	\$410,281	\$23,755	\$390,588
2013	\$ 758,916	\$398,399	\$394,494	\$23,962	\$374,437
2014	\$ 712,356	\$381,926	\$378,181	\$24,157	\$357,768

Year	Survivorship to Start of year	Interest Discount to end of 2008	Mortality Rate During Year	Discounted Additional Benefits Within Year
2008				
2009	1.00000	.97590	.04426	\$21,432
2010	.95574	.92943	.04946	\$20,286
2011	.90847	.88517	.05519	\$19,004
2012	.85833	.84302	.06146	\$17,601
2013	.80558	.80288	.06788	\$15,999
2014	.75090	.76464	.07477	\$14,347
				-----
				\$108,669

(ii) Because the sum of the notional account balance and the actuarial present value of the additional death benefit is more than 120 percent of the notional account value, the exclusion under paragraph (b)(1) of this A-12 does not apply for 2009. Therefore, for

purposes of applying the rules in §1.401(a)(9)-5, the entire interest under Contract S must include the actuarial present value of the additional death benefit.

Appendix B

GMDB EXAMPLE 1 - Using Attained AGE @ EOY & Projection Rate of 6.5%

Gross Return	8.50%
Net Return (Projection Rate):	6.50%
Discount Rate:	5.00%
Attained Age	78
Current Age	mos 9
Max benefit Age	84
Account Value 2008	\$550,000
Death Benefit 2008	\$1,000,000.00
FW Rate=	0.00%
Actuarial P.V. of benefits in year 2008:	\$ 66,612
Actuarial P.V. of Benefits/E.O.Y. Notional Account after WD in 2008	12.111%
Actuarial P.V. of benefits in year 2008:	>20% of AV

Year	Attained Age EOY	Death Benefit During Year Before Withdrawal	End-of-Year Notional Account before RMD Withdrawal	Average Notional Account	RMD Withdrawal at End of Year	End-of-Year Notional Account after Withdrawal	Survivorship to Start of Year	Interest Discount to End of 2008	Mortality Rate During Year	Full Withdrawal Rate (EOY Decrement)	Discounted Additional Benefits Within Year
2008	78	\$ 1,000,000				\$ 550,000					
2009	79	\$ 950,739	\$ 585,750	\$ 567,875	\$ 28,205	\$ 557,545	1.000000	0.97590	0.04546	0.00000	\$ 16,987
2010	80	\$ 901,983	\$ 593,785	\$ 575,665	\$ 29,815	\$ 563,970	0.95454	0.92943	0.05080	0.00000	\$ 14,705
2011	81	\$ 853,749	\$ 600,628	\$ 582,299	\$ 31,507	\$ 569,121	0.90605	0.88517	0.05666	0.00000	\$ 12,334
2012	82	\$ 806,053	\$ 606,114	\$ 587,618	\$ 33,282	\$ 572,832	0.85472	0.84302	0.06306	0.00000	\$ 9,926
2013	83	\$ 758,916	\$ 610,066	\$ 591,449	\$ 35,143	\$ 574,923	0.80082	0.80288	0.06948	0.00000	\$ 7,481
2014	84	\$ 712,356	\$ 612,293	\$ 593,608	\$ 37,092	\$ 575,202	0.74518	0.76464	0.07654	0.00000	\$ 5,179
TOTAL											\$ 66,612

1. The Death Benefit during year before Withdrawal is equal to the Prior Years benefit reduced for prior years RMD distribution. The Death Benefit is reduced by ratio of the withdrawal to the beginning of year Notional Account.
2. End of Year Notional Account Before RMD Withdrawal is equal to the Notional Account value at the end of the prior year increased by the projection rate.
3. The RMD payment is based on age at the end of the year in which it is taken.
4. Survivorship is a function of both mortality and full withdrawals.
5. Mortality during any given year based on age-nearest birthday, where this person is 78 years, 9 months old on 12/31/2008.

Appendix B (Continued)

GMDB EXAMPLE 2 - Using Attained AGE @ EOY & Projection Rate of 6.5% & Full Withdrawal Rate of 7%

Gross Return	8.50%
Net Return (Projection Rate)	6.50%
Discount Rate	5.00%
Current Year	2008
Attained Age	78
Current Age	9 mos
Max benefit Age	84
Account Value 2008	\$550,000
Death Benefit 2008	\$1,000,000.00
FW Rate	7.00%
Actuarial P.V. of benefits in year 2008	\$ 58,513
Actuarial P.V. of Benefits/E.O.Y. Notional Account after WD in 2008	10.639%
Actuarial P.V. of benefits in year 2008	>20% of AV

Year	Attained Age EOY	Death Benefit During Year Before Withdrawal	End-of-Year Notional Account before RMD Withdrawal	Average Notional Account	RMD Withdrawal at End of Year	End-of-Year Notional Account after Withdrawal	Survivorship to Start of Year	Interest Discount to End of 2008	Mortality Rate During Year	Full Withdrawal Rate (EOY Decrement)	Discounted Additional Benefits Within Year
2008	78	\$ 1,000,000				\$ 550,000					
2009	79	\$ 950,739	\$ 585,750	\$ 567,875	\$ 28,205	\$ 557,545	1.000000	0.97590	0.04546	0.07000	\$ 16,987
2010	80	\$ 901,983	\$ 593,785	\$ 575,665	\$ 29,815	\$ 563,970	0.88772	0.92943	0.05080	0.07000	\$ 13,676
2011	81	\$ 853,749	\$ 600,628	\$ 582,299	\$ 31,507	\$ 569,121	0.78364	0.88517	0.05666	0.07000	\$ 10,668
2012	82	\$ 806,053	\$ 606,114	\$ 587,618	\$ 33,282	\$ 572,832	0.68750	0.84302	0.06306	0.07000	\$ 7,984
2013	83	\$ 758,916	\$ 610,066	\$ 591,449	\$ 35,143	\$ 574,923	0.59905	0.80288	0.06948	0.07000	\$ 5,596
2014	84	\$ 712,356	\$ 612,293	\$ 593,608	\$ 37,092	\$ 575,202	0.51841	0.76464	0.07654	0.07000	\$ 3,603
TOTAL											\$ 58,513

1. The Death Benefit during year before Withdrawal is equal to the Prior Years benefit reduced for prior years RMD distribution. The Death Benefit is reduced by ratio of the withdrawal to the beginning of year Notional Account.
2. End of Year Notional Account Before RMD Withdrawal is equal to the Notional Account value at the end of the prior year increased by the projection rate.
3. The RMD payment is based on age at the end of the year in which it is taken.
4. Survivorship is a function of both mortality and full withdrawals.
5. Mortality during any given year based on age-nearest birthday, where this person is 78 years, 9 months old on 12/31/2008.
6. The decrement for full withdrawals are assumed to be taken at the EOY.

Appendix C

GMAB EXAMPLE Using Attained AGE @ EOY & Projection Rate of 6.5% & Full Withdrawal Rate of 7%

Gross Return	8.50%
Net Return (Projection Rate):	6.50%
Discount Rate:	5.00%
Attained Age	78
GMAB Recalibration Date	2014
Max benefit Age	84
Account Value 2008	\$550,000
GMAB Benefit 2008	\$900,000
FW Rate=	7.00%
Annual Rider Fee	0.50%
Actuarial P.V. of Benefits in year 2008:	\$ 18,834
P.V. of Benefit Fees in year 2008:	\$ 11,467
Actuarial PV Net of Fees	\$ 7,367
Actuarial P.V. of Benefits/E.O.Y. Notional Account after WD in 2008	1.339%
Actuarial P.V. of benefits in year 2008:	>20% of AV

Year	Attained Age EOY	GMAB Benefit During Year Before Withdrawal	End-of-Year Notional Account before RMD Withdrawal	Average Notional Account	RMD Withdrawal at End of Year	End-of-Year Notional Account after Withdrawal	Survivorship to Start of Year	Interest Discount to End of 2008	Mortality Rate During Year	Full Withdrawal Rate (EOY Decrement)	Discounted Additional Benefits Within Year	Discounted Rider Fee (based on average Notional Account )
2008	78	\$ 900,000				\$ 550,000						
2009	79	\$ 855,665	\$ 585,750	\$ 567,875	\$ 28,205	\$ 557,545	1.000000	0.97590	0.04546	0.07000	\$ -	\$ 2,771
2010	80	\$ 811,785	\$ 593,785	\$ 575,665	\$ 29,815	\$ 563,970	0.88772	0.92943	0.05080	0.07000	\$ -	\$ 2,375
2011	81	\$ 768,374	\$ 600,628	\$ 582,299	\$ 31,507	\$ 569,121	0.78364	0.88517	0.05666	0.07000	\$ -	\$ 2,020
2012	82	\$ 725,448	\$ 606,114	\$ 587,618	\$ 33,282	\$ 572,832	0.68750	0.84302	0.06306	0.07000	\$ -	\$ 1,703
2013	83	\$ 683,024	\$ 610,066	\$ 591,449	\$ 35,143	\$ 574,923	0.59905	0.80288	0.06948	0.07000	\$ -	\$ 1,422
2014	84	\$ 641,121	\$ 612,293	\$ 593,608	\$ 37,092	\$ 575,202	0.51841	0.76464	0.07654	0.07000	\$ 18,834	\$ 1,177
TOTAL											\$ 18,834	\$ 11,467

1. The GMAB Benefit during year before Withdrawal is equal to the Prior Years benefit reduced for prior years RMD distribution The GMAB Benefit is reduced by ratio of the withdrawal to the beginning of year Notional Account.
2. End of Year Notional Account Before RMD Withdrawal is equal to the Notional Account value at the end of the prior year increased by the projection rate.
3. The RMD payment is based on age at the end of the year in which it is taken.
4. Survivorship is a function of both mortality and full withdrawals
5. Mortality during any given year based on age at EOY
- 6 The decrement for Full Withdrawals and Benefit Fees are assumed to be taken at the EOY
7. P.V. of Benefit fees use the Average Notional Account Value as the base, adjusted for survivorship and discounted the same way the Gross Additional Benefit cost  
So in 2009, PV of Fees = 567,875 x 1.0000 x .97590

Appendix D

GMIB EXAMPLE

This example assumes a person attained age 78 years and 2 months has a GMIB rollup benefit on his variable annuity contract. The benefit expires at attained age 84.

The benefit is reduced on a dollar-for-dollar basis for withdrawals, so the exclusion test does not apply. The following is the calculation of the actuarial present value for his 2009 distribution year.

Gross Earnings Rate	8.5%
Net Rate (Projection Rate)	6.5%
Discount Rate	5.0%
Attained Age	78 yrs, 2 mo.
Max benefit age	84
GMIB Rollup Rate	6.0%
Benefit Base at end of 2008 after withdrawal adjustment (2007 RMD payment)	\$ 1,000,000
Account Value at end of 2008 after withdrawal adjustment (2007 RMD payment)	\$ 550,000
Full Withdrawal Rate	7%
Contract Date	4/1/1985

Year	Attained Age EOY	GMIB Benefit Beginning of Year (= 12/31/prior year)	GMIB Benefit on Anniversary	Ratio of GMIB payout factors to current base contract annuity payout factors	Account Value on Anniversary	Withdrawal at End of Year (RMD)	End-of-Year Account Value after Withdrawal	Additional Benefits= GMIB Benefit on Anniversary x Ratio of payout factors - Account Value on Anniversary (minimum of zero)
2008	78						\$ 550,000	
2009	79	\$ 1,000,000	\$ 1,014,633	0.70	\$ 558,703	\$ 28,205	\$ 557,545	\$ 151,540
2010	80	\$ 1,031,795	\$ 1,046,893	0.70	\$ 566,368	\$ 29,815	\$ 563,970	\$ 166,458
2011	81	\$ 1,063,887	\$ 1,079,456	0.70	\$ 572,895	\$ 31,507	\$ 569,121	\$ 182,724
2012	82	\$ 1,096,214	\$ 1,112,255	0.70	\$ 578,127	\$ 33,282	\$ 572,832	\$ 200,451
2013	83	\$ 1,128,705	\$ 1,145,221	0.70	\$ 581,897	\$ 35,143	\$ 574,923	\$ 219,758
2014	84	\$ 1,161,284	\$ 1,178,277	0.70	\$ 584,021	\$ 37,092	\$ 575,202	\$ 240,773
2015	85	\$ 1,193,869	\$ 1,211,339	0.70	\$ 584,304	\$ 38,865	\$ 573,725	\$ 263,634

1 The GMIB Benefit Beginning of year is equal to the Prior Years benefit reduced for prior years RMD distribution

2 GMIB Benefit on Anniversary is equal to the GMIB Benefit Beginning of Year accumulated at the rollup rate: \$1000,000 \*(1.06)^(91/365)

3 GMIB has different payout factors than base contract, so adjustment applied for comparison

4 Account Value on Anniversary is equal to the Account Value end of prior year after withdrawal accumulated at the projection rate: \$550,000\*(1.065)^(91/365)

5 RMD is equal to the End of prior years Account Value after withdrawal divided by the uniform life table factor for age at end of current year. The factor for age 78 is 19.5

6 End of Year Account Value after withdrawal is equal to the end of prior year Account Value after withdrawal accumulated with interest at the projection rate minus the distribution

Survivorship to Start of Year	Interest Discount to End of 2008	Mortality Rate During Year	Full Lapse Rate During Year	GMIB Exercise Rate (10% if in-the-money)	Discounted GMIB Benefit Within Year	Benefit Charges (40 bps x beginning of year benefit base)	PV of Benefit Charges	Net Actuarial Present Value of Additional Benefits
\$ 1.000000	0.98791	0.040636	0.07	10.0%	\$ 14,819	\$ 4,000	\$ 4,000	\$ 10,819
\$ 0.802988	0.940878	0.045463	0.07	10.0%	\$ 12,433	\$ 4,127	\$ 3,156	\$ 9,277
\$ 0.641545	0.89606	0.050795	0.07	10.0%	\$ 10,371	\$ 4,256	\$ 2,476	\$ 7,895
\$ 0.509698	0.85339	0.056655	0.07	10.0%	\$ 8,596	\$ 4,385	\$ 1,931	\$ 6,665
\$ 0.402447	0.81276	0.063064	0.07	10.0%	\$ 7,075	\$ 4,515	\$ 1,495	\$ 5,580
\$ 0.315605	0.77405	0.069481	0.07	10.0%	\$ 5,780	\$ 4,645	\$ 1,149	\$ 4,631
\$ 0.245807	0.73719	0.076539	0.07	10.0%	\$ 4,686	\$ 4,775	\$ 876	\$ 3,810
					\$ 63,761		\$ 15,083	\$ 48,678

7 Survivorship is a function of both mortality, full withdrawals and GMIB exercise rate

8 Discount at 5% from contract anniversary to 12/31/2008: ((1.05)^-(91/365)) \* ((1.05)^-1)

9 Mortality during any given year based on age-nearest birthday at the beginning of the year

10 Full Lapse assumed at end of year

11 Discounted Benefit amount is equal to Benefit amount x survivorship to anniversary assuming UDD x interest discount to 12/31/2008 x GMIB exercise rate if in-the-money (1.000 x (1-(91/365)\*(1-qx)) \*

12 PV of Charges is equal to charge x survivorship to beginning of year x interest discount from the beginning of year to 12/31/2008

13 Net Present Value is equal to the Discounted GMIB benefit minus the Present Value of Benfit Charges

Appendix D (Continued)

GMDB & GMIB Combined EXAMPLE

This example assumes a person attained age 78 has both a GMDB rollup and GMIB rollup benefit on his variable annuity contract. Both benefits expire at attained age 84.

The rollups are reduced on a dollar-for-dollar basis for withdrawals. The following is the calculation of the actuarial present value for his 2009 distribution year.

Gross Earnings Rate	8.5%
Net Rate (Projection Rate)	6.5%
Discount Rate	5.0%
Attained Age	78 yrs, 2 mo.
Max benefit age	84
GMIB Rollup Rate	6.0%
GMDB Rollup Rate	6.0%
Benefit Base at end of 2008 after withdrawal adjustment (2007 RMD payment)	\$ 1,000,000
Account Value at end of 2008 after withdrawal adjustment (2007 RMD payment)	\$ 550,000
Full Withdrawal Rate	7%

Year	Attained Age	Death Benefit Beginning of Year (= 12/31/prior year)	Death Benefit End of Year before withdrawal	Average Death Benefit During Year	End-of-Year Account Value before Withdrawal	Withdrawal at End of Year (RMD)	End-of-Year Account Value after Withdrawal	Average Account Account	Additional Benefits Within Year (Avg DB minus Avg Acct Value)
2008	78						\$ 550,000		
2009	79	\$ 1,000,000	\$ 1,060,000 <sup>2</sup>	\$ 1,030,000	\$ 585,750 <sup>3</sup>	\$ 28,205 <sup>4</sup>	\$ 557,545 <sup>5</sup>	\$ 567,875	\$ 462,125
2010	80	\$ 1,031,795 <sup>1</sup>	\$ 1,093,703	\$ 1,062,749	\$ 593,785	\$ 29,815	\$ 563,970	\$ 575,665	\$ 487,084
2011	81	\$ 1,063,887	\$ 1,127,721	\$ 1,095,804	\$ 600,628	\$ 31,507	\$ 569,121	\$ 582,299	\$ 513,505
2012	82	\$ 1,096,214	\$ 1,161,987	\$ 1,129,100	\$ 606,114	\$ 33,282	\$ 572,832	\$ 587,618	\$ 541,482
2013	83	\$ 1,128,705	\$ 1,196,427	\$ 1,162,566	\$ 610,066	\$ 35,143	\$ 574,923	\$ 591,449	\$ 571,116
2014	84	\$ 1,161,284	\$ 1,230,961	\$ 1,196,122	\$ 612,293	\$ 37,092	\$ 575,202	\$ 593,608	\$ 602,514
2015	85	\$ 1,193,869	\$ 1,265,501	\$ 1,229,685	\$ 612,590	\$ 38,865	\$ 573,725	\$ 593,896	\$ 635,790

1 The Death Benefit Beginning of Year is equal to the Prior End of Year benefit reduced for prior years RMD distribution

2 Death Benefit End of Year before Withdrawal is equal to Beginning of Year benefit accumulated at the rollup rate

3 End of Year Account Value Before RMD Withdrawal is equal to the Account Value at the end of the prior year after prior year RMD withdrawal increased by the projection rate.

4 RMD is equal to the End of prior years Account Value after withdrawal divided by the uniform life table factor for age at end of current year. The factor for age 78 is 19.5

5 End of Year Account Value after withdrawal is equal to the end of year Account Value before RMD withdrawal minus the distribution

Survivorship to Start of Year	Interest Discount to End of 2008	Mortality Rate During Year	Full Lapse Rate During Year	GMIB Exercise Rate (10% if in-the-money)	Discounted GMDB Benefit Within Year	Discounted GMIB Benefit (from above)	Total Discounted Additional Benefits Within Year	Benefit Charges (25 bps x beginning of year benefit base)	PV of GMDB Benefit Charges	PV of GMIB Benefit Charges (from above)	Total PV of Charges	Net Actuarial Present Value of Additional Benefits
1.00000	0.97590	0.040636	0.07 <sup>9</sup>	10.0%	\$ 18,326	\$ 14,819	\$ 33,145	\$ 2,500	\$ 2,500	\$ 4,000	\$ 6,500	\$ 26,645
0.80299 <sup>6</sup>	0.92943 <sup>7</sup>	0.045463 <sup>8</sup>	0.07	10.0%	\$ 16,527 <sup>10</sup>	\$ 12,433	\$ 28,960	\$ 2,579	\$ 1,973	\$ 3,156	\$ 5,129	\$ 23,831
0.64154	0.88517	0.050795	0.07	10.0%	\$ 14,812	\$ 10,371	\$ 25,183	\$ 2,660	\$ 1,548	\$ 2,476	\$ 4,024	\$ 21,159
0.50970	0.84302	0.056655	0.07	10.0%	\$ 13,182	\$ 8,596	\$ 21,778	\$ 2,741	\$ 1,207	\$ 1,931	\$ 3,137	\$ 18,640
0.40245	0.80288	0.063064	0.07	10.0%	\$ 11,638	\$ 7,075	\$ 18,713	\$ 2,822	\$ 934	\$ 1,495	\$ 2,429	\$ 16,284
0.31561	0.76464	0.069481	0.07	10.0%	\$ 10,103	\$ 5,780	\$ 15,883	\$ 2,903	\$ 718	\$ 1,149	\$ 1,867	\$ 14,016
0.24581	0.72823	0.076539	0.07	10.0%	\$ 8,711	\$ 4,686	\$ 13,397	\$ 2,985	\$ 547	\$ 876	\$ 1,423	\$ 11,974
					\$ 93,298	\$ 63,761	\$ 157,059		\$ 9,427	\$ 15,083	\$ 24,509	\$ 132,550

6 Survivorship is a function of both mortality, full withdrawals and GMIB exercise rate

7 Discount at 5% from middle of year to 12/31/2008:  $(1.05)^{-1.5}$

8 Mortality during any given year based on age-nearest birthday at the beginning of the year

9 Full Lapse assumed at end of year

10 Discounted Benefit amount is equal to Benefit amount x survivorship to beginning of year x interest discount from middle of year to 12/31/2008 x probability of death during year

Appendix E

GMWB EXAMPLE 1 - Withdraw the greater of GMWB amount and RMD

This example assumes a person attained age 71 has a GMWB benefit on his variable annuity contract. The benefit allows him to take up to \$70,000 per year from the contract even if no account value remains.

We are currently calculating the actuarial present value for his 2009 distribution year. He has not taken any prior withdrawals.

Gross Return	7.0%
Net Return (Projection Rate)	5.0%
Discount Rate	5.0%
Attained Age	71
Benefit Base at end of 2008 before withdrawal adjustment (2007 RMD payment)	\$ 1,000,000
Account Value at end of 2008 after withdrawal adjustment (2007 RMD payment)	\$ 550,000
Full Withdrawal Rate	7%
Contract Date	7/1/1985

Year	Attained Age EOY	GMWB Benefit Beginning of Year (= 12/31/prior year)	GMWB Withdrawal Amount	RMD	End-of-Year Account Value before Withdrawal	Withdrawal at End of Year (Greater of GMWB Withdrawal Amount and RMD)	End-of-Year Account Value after Withdrawal	Additional Benefits (When Account Value = 0 and GMWB Withdrawals are still available)	Survivorship to Start of Year	Interest Discount to End of 2008	Mortality Rate During Year	Full Lapse Rate During Year	Discounted GMWB Benefit Within Year	Benefit Charges (25 bps x beginning of year benefit base)	PV of Benefit Charges	Net Actuarial Present Value of Additional Benefits
2008	71						\$ 550,000									
2009	72	\$ 1,000,000	\$ 70,000	\$ 21,484	\$ 577,500	\$ 70,000	\$ 507,500		1.00000	0.95238	0.020025	0.07		\$ 2,500	\$ 2,500	\$ (2,500)
2010	73	\$ 930,000	\$ 70,000	\$ 20,547	\$ 532,875	\$ 70,000	\$ 462,875		0.91138	0.90703	0.024187	0.07		\$ 2,325	\$ 2,018	\$ (2,018)
2011	74	\$ 860,000	\$ 70,000	\$ 19,449	\$ 486,019	\$ 70,000	\$ 416,019		0.82891	0.86384	0.024187	0.07		\$ 2,150	\$ 1,616	\$ (1,616)
2012	75	\$ 790,000	\$ 70,000	\$ 18,167	\$ 436,820	\$ 70,000	\$ 366,820		0.75224	0.82270	0.026581	0.07		\$ 1,975	\$ 1,283	\$ (1,283)
2013	76	\$ 720,000	\$ 70,000	\$ 16,674	\$ 385,161	\$ 70,000	\$ 315,161		0.68099	0.78353	0.029310	0.07		\$ 1,800	\$ 1,008	\$ (1,008)
2014	77	\$ 650,000	\$ 70,000	\$ 14,866	\$ 330,919	\$ 70,000	\$ 260,919		0.61476	0.74622	0.032392	0.07		\$ 1,625	\$ 783	\$ (783)
2015	78	\$ 580,000	\$ 70,000	\$ 12,853	\$ 273,965	\$ 70,000	\$ 203,965		0.55321	0.71068	0.036288	0.07		\$ 1,450	\$ 599	\$ (599)
2016	79	\$ 510,000	\$ 70,000	\$ 10,460	\$ 214,163	\$ 70,000	\$ 144,163		0.49581	0.67684	0.040636	0.07		\$ 1,275	\$ 449	\$ (449)
2017	80	\$ 440,000	\$ 70,000	\$ 7,709	\$ 151,371	\$ 70,000	\$ 81,371		0.44237	0.64461	0.045463	0.07		\$ 1,100	\$ 329	\$ (329)
2018	81	\$ 370,000	\$ 70,000	\$ 4,546	\$ 85,440	\$ 70,000	\$ 15,440		0.39270	0.61391	0.050795	0.07		\$ 925	\$ 234	\$ (234)
2019	82	\$ 300,000	\$ 70,000	\$ 903	\$ 16,212	\$ 70,000	\$ 70,000	\$ 53,788	0.34666	0.58468	0.056655	0.00	\$ 10,284	\$ 750	\$ 160	\$ 10,125
2020	83	\$ 230,000	\$ 70,000			\$ 70,000	\$ 70,000	\$ 70,000	0.32702	0.55684	0.000000	0.00	\$ 12,747	\$ 575	\$ 110	\$ 12,637
2021	84	\$ 160,000	\$ 70,000			\$ 70,000	\$ 70,000	\$ 70,000	0.32702	0.53032	0.000000	0.00	\$ 12,140	\$ 400	\$ 73	\$ 12,067
2022	85	\$ 90,000	\$ 70,000			\$ 70,000	\$ 70,000	\$ 70,000	0.32702	0.50507	0.000000	0.00	\$ 11,562	\$ 225	\$ 39	\$ 11,523
2023	86	\$ 20,000	\$ 20,000			\$ 20,000	\$ 20,000	\$ 20,000	0.32702	0.48102	0.000000	0.00	\$ 3,146	\$ 50	\$ 8	\$ 3,138
Actuarial Present Value													\$ 49,879	\$ 11,210	\$ 38,668	12

- 1 The GMWB Benefit Beginning of year is equal to the Prior Years benefit reduced for prior years RMD distribution
- 2 GMWB withdrawal amount is \$70,000 per year, then remaining benefit base in final year that it runs out
- 3 RMD is equal to the End of prior years Account Value after withdrawal divided by the uniform life table factor for age at end of current year.
- 4 End of Year Account Value Before RMD Withdrawal is equal to the Account Value at the end of the prior year after prior year RMD withdrawal increased by the projection rate.
- 5 End of Year Account Value after withdrawal is equal to the end of prior year Account Value after withdrawal accumulated with interest at the projection rate minus the distribution
- 6 Benefit is the maximum of the GMWB withdrawal amount less the account value and zero.
- 7 Survivorship is a function of both mortality and full withdrawals
- 8, 9 Once Account Value equals zero, the remaining benefit continues to be paid to a beneficiary upon death, so mortality and lapse rates are set to zero  
Since mortality is UDD and lapse rates are end of year, the lapse rate disappears sooner.
- 10 Discounted Benefit amount is equal to Benefit amount x survivorship to beginning of year x interest from the end of year to 12/31/2008 x probability of surviving current year
- 11 PV of Charges is equal to charge x survivorship to beginning of year x interest discount from the beginning of year to 12/31/2008
- 12 Net Present Value is equal to the Discounted GMWB benefit minus the Present Value of Benefit Charges

Appendix E (Continued)

GMWB EXAMPLE 2 - Withdraw the average of the GMWB amount and RMD

Gross Return	7.0%
Net Return (Projection Rate)	5.0%
Discount Rate	5.0%
Attained Age	71
Benefit Base at end of 2008 before withdrawal adjustment (2007 RMD payment)	\$ 1,000,000
Account Value at end of 2008 after withdrawal adjustment (2007 RMD payment)	\$ 550,000
Full Withdrawal Rate	7%
Contract Date	7/1/1985

Year	Attained Age EOY	GMWB Benefit Beginning of Year (= 12/31/prior year)	GMWB Withdrawal Amount	RMD	End-of-Year Account Value before Withdrawal	Withdrawal at End of Year*	End-of-Year Account Value after Withdrawal	Additional Benefits (When Account Value = 0 and GMWB Withdrawals are still available)	Survivorship to Start of Year	Interest Discount to End of 2008	Mortality Rate During Year	Full Lapse Rate During Year	Discounted GMWB Benefit Within Year	Benefit Charges (25 bps x beginning of year benefit base)	PV of Benefit Charges	Net Actuarial Present Value of Additional Benefits
2008	71															
2009	72	\$ 1,000,000	\$ 70,000	\$ 21,484	\$ 577,500	\$ 45,742	\$ 531,758		1.00000	0.95238	0.020025	0.07		\$ 2,500	\$ 2,500	\$ (2,500)
2010	73	\$ 954,258	\$ 70,000	\$ 21,529	\$ 558,346	\$ 45,764	\$ 512,581		0.91138	0.90703	0.022026	0.07		\$ 2,386	\$ 2,071	\$ (2,071)
2011	74	\$ 908,493	\$ 70,000	\$ 21,537	\$ 538,210	\$ 45,769	\$ 492,442		0.82891	0.86384	0.024187	0.07		\$ 2,271	\$ 1,708	\$ (1,708)
2012	75	\$ 862,725	\$ 70,000	\$ 21,504	\$ 517,064	\$ 45,752	\$ 471,312		0.75224	0.82270	0.026581	0.07		\$ 2,157	\$ 1,402	\$ (1,402)
2013	76	\$ 816,973	\$ 70,000	\$ 21,423	\$ 494,878	\$ 45,712	\$ 449,166		0.68099	0.78353	0.029310	0.07		\$ 2,042	\$ 1,144	\$ (1,144)
2014	77	\$ 771,261	\$ 70,000	\$ 21,187	\$ 471,624	\$ 45,594	\$ 426,031		0.61476	0.74622	0.032392	0.07		\$ 1,928	\$ 929	\$ (929)
2015	78	\$ 725,668	\$ 70,000	\$ 20,987	\$ 447,332	\$ 45,493	\$ 401,839		0.55321	0.71068	0.036288	0.07		\$ 1,814	\$ 749	\$ (749)
2016	79	\$ 680,174	\$ 70,000	\$ 20,607	\$ 421,931	\$ 45,304	\$ 376,627		0.49581	0.67684	0.040636	0.07		\$ 1,700	\$ 599	\$ (599)
2017	80	\$ 634,871	\$ 70,000	\$ 20,140	\$ 395,459	\$ 45,070	\$ 350,388		0.44237	0.64461	0.045463	0.07		\$ 1,587	\$ 475	\$ (475)
2018	81	\$ 589,801	\$ 70,000	\$ 19,575	\$ 367,908	\$ 44,787	\$ 323,120		0.39270	0.61391	0.050795	0.07		\$ 1,475	\$ 373	\$ (373)
2019	82	\$ 545,013	\$ 70,000	\$ 18,896	\$ 339,276	\$ 44,448	\$ 294,829		0.34666	0.58468	0.056655	0.07		\$ 1,363	\$ 290	\$ (290)
2020	83	\$ 500,565	\$ 70,000	\$ 18,088	\$ 309,570	\$ 44,044	\$ 265,526		0.30413	0.55684	0.063064	0.07		\$ 1,251	\$ 223	\$ (223)
2021	84	\$ 456,521	\$ 70,000	\$ 17,131	\$ 278,802	\$ 43,565	\$ 235,237		0.26500	0.53032	0.069481	0.07		\$ 1,141	\$ 168	\$ (168)
2022	85	\$ 412,956	\$ 70,000	\$ 15,894	\$ 246,999	\$ 42,947	\$ 204,052		0.22933	0.50507	0.076539	0.07		\$ 1,032	\$ 126	\$ (126)
2023	86	\$ 370,009	\$ 70,000	\$ 14,472	\$ 214,254	\$ 42,236	\$ 172,018		0.19695	0.48102	0.084129	0.07		\$ 925	\$ 92	\$ (92)
2024	87	\$ 327,773	\$ 70,000	\$ 12,837	\$ 180,619	\$ 41,419	\$ 139,201		0.16775	0.45811	0.092686	0.07		\$ 819	\$ 66	\$ (66)
2025	88	\$ 286,354	\$ 70,000	\$ 10,961	\$ 146,161	\$ 40,480	\$ 105,680		0.14155	0.43630	0.103014	0.07		\$ 716	\$ 46	\$ (46)
2026	89	\$ 245,874	\$ 70,000	\$ 8,807	\$ 110,964	\$ 39,403	\$ 71,561		0.11808	0.41552	0.114434	0.07		\$ 615	\$ 32	\$ (32)
2027	90	\$ 206,471	\$ 70,000	\$ 6,277	\$ 75,139	\$ 38,139	\$ 37,001		0.09725	0.39573	0.126925	0.07		\$ 516	\$ 21	\$ (21)
2028	91	\$ 168,332	\$ 70,000	\$ 3,426	\$ 38,851	\$ 36,713	\$ 2,138		0.07896	0.37689	0.140650	0.07		\$ 421	\$ 13	\$ (13)
2029	92	\$ 131,619	\$ 70,000	\$ 210	\$ 2,244	\$ 35,105		\$ 32,860	0.06311	0.35894	0.154664	0.00	\$ 629	\$ 329	\$ 8	\$ 621
2030	93	\$ 96,514	\$ 70,000			\$ 70,000		\$ 70,000	0.05335	0.34185	0.000000	0.00	\$ 1,277	\$ 241	\$ 5	\$ 1,272
2031	94	\$ 26,514	\$ 26,514			\$ 26,514		\$ 26,514	0.05335	0.32557	0.000000	0.00	\$ 461	\$ 66	\$ 1	\$ 459
Actuarial Present Value													\$ 2,366		\$ 13,040	\$ 0

\* If account value is positive, assumes take the average of the RMD and the Greater of GMWB Withdrawal Amount and RMD. If the account value is zero, the GMWB withdrawal amount is taken.

## Appendix F

The following example shows an Earnings Enhanced Death Benefit rider ("EEDB") attached to a variable annuity contract. This type of feature pays an additional percentage of "earnings" in the contract upon death of the policy owner / annuitant, with these earnings being those accumulated since the rider was made part of the contract. Here we assume the benefit is 40% of "earnings", with a cap on the benefit paid equal to 100% of the benefit "premium", which is equal to the account value at the time the rider was made part of the contract. We also assume that any partial withdrawals first come out of "earnings" for purposes of calculating the benefit. There is a fee of 25 bp's of account value in this example and we included this fee as an offset to the actuarial present value of the benefit. "Survivorship" includes both full policy lapsation and mortality.

Age as of Val. Date: 71  
 Gross Growth: 8.50%  
 Contract Charges: 2.00%  
 Net Growth: 6.50%  
 EEDB Benefit %: 40% percentage of EEDB Gain  
 EEDB Benefit Cap %: 100% percentage of EEDB Premium Base  
 EEDB Fee: 0.25% annual percentage of average daily AV  
 Annual policy lapsation: 7.00%  
 Discount Rate: 5.00%

Year	Attained Age EOY	EEDB Premium Base	EEDB Gain	EEDB Benefit	EOY Notional Acct. before RMD	RMD Withdrawal	EOY Notional Acct. after RMD	Avg. Notional Account	Survivorship Start of Year	Interest Discount	Mortality During Year	APV EEDB	Fee	APV Fee	APV EEDB - Fee
2005	71	75,000.00	25,000.00	10,000.00			100,000.00		100.00%						
2006	72	75,000.00	27,401.64	10,960.66	106,500.00	4,098.36	102,401.64	103,250.00	91.14%	0.9524	2.20%	229.92	250.00	216.99	33.01
2007	73	75,000.00	29,700.23	11,880.09	109,057.75	4,357.52	104,700.23	105,729.69	82.89%	0.9070	2.42%	237.53	253.00	190.22	62.78
2008	74	75,000.00	31,893.40	12,757.36	111,505.74	4,612.34	106,893.40	108,102.99	75.22%	0.8638	2.66%	242.81	258.88	168.22	90.65
2009	75	75,000.00	33,938.10	13,575.24	113,841.47	4,903.37	108,938.10	110,367.43	68.10%	0.8227	2.93%	246.24	264.49	148.18	116.31
2010	76	75,000.00	35,806.73	14,322.69	116,019.08	5,212.35	110,806.73	112,478.59	61.48%	0.7835	3.24%	247.55	269.79	129.95	139.84
2011	77	75,000.00	37,496.40	14,998.56	118,009.17	5,512.77	112,496.40	114,407.95	55.32%	0.7462	3.63%	249.68	274.68	113.39	161.29
2012	78	75,000.00	38,949.47	15,579.79	119,808.66	5,859.19	113,949.47	116,152.53	49.58%	0.7107	4.06%	248.91	279.13	98.35	180.77
2013	79	75,000.00	40,163.28	16,065.31	121,356.19	6,192.91	115,163.28	117,652.83	44.24%	0.6768	4.55%	245.10	283.06	84.75	198.31
2014	80	75,000.00	41,105.53	16,442.21	122,648.90	6,543.37	116,105.53	118,906.09	39.27%	0.6446	5.08%	238.16	286.39	72.50	213.89
2015	81	75,000.00	41,741.34	16,696.54	123,652.39	6,911.04	116,741.34	119,878.96	34.67%	0.6139	5.67%	228.05	289.09	61.52	227.56

Appendix G

**Example**                      **IRS Example of 2 Tiered Fixed Annuity Using Attained Age @ EOY, Projection Rates of 3% and 4%, Full Withdrawal Rate of 7%, and Annuitization Rate of 5%**

**Projection Rate (Tier 1)**                      **3%**  
**Projection Rate (Tier 2)**                      **4%**  
**Discount Rate**                                      **5%**  
**Age as of Val. Date:**                              **78**  
**Maximum Annuity Date**                              **85**  
Account Value (Tier 1) at end of  
2008 **after** withdrawal  
adjustment (2007 RMD payment)              **\$100,000.00**  
Account Value (Tier 2) at end of  
2008 **after** withdrawal  
adjustment (2007 RMD payment)              **\$120,000.00**  
Full Withdrawal Rate                              **7.00%**  
Annuitization Rate                                      **5.00%**

Year	Age	End-of-Year Notional Account (Tier 2) before RMD Withdrawal	Average Notional Account (Tier 2)	End-of-Year Notional Account (Tier 2) after Withdrawal	End-of-Year Notional Account (Tier 1) before RMD Withdrawal	Average Notional Account (Tier 1)	RMD Withdrawal at End of Year	End-of-Year Notional Account (Tier 1) after Withdrawal	Survivorship to Start of Year	Persistence to Start of Year	Interest Discount to End of 2008	Mortality Rate During Year	Full Withdrawal Rate (EOY Decrement)	Annuitization Rate	Discounted Additional Benefits Within Year
2008	78			\$ 120,000				\$ 100,000							
2009	79	124,800 <sup>1</sup>	\$ 122,400 <sup>2</sup>	\$ 118,489 <sup>3</sup>	\$ 103,000 <sup>4</sup>	101,500 <sup>5</sup>	\$ 5,208 <sup>6</sup>	\$ 97,792 <sup>7</sup>	1.000000	1.000000	0.97590	0.04064	0.07000	0.05000	\$ 1,020
2010	80	123,229	\$ 120,859	\$ 116,727	\$ 100,725	99,259	\$ 5,315	\$ 95,411	0.95936	0.88350	0.92943	0.04546	0.07000	0.05000	\$ 851
2011	81	121,396	\$ 119,061	\$ 114,699	\$ 98,273	96,842	\$ 5,421	\$ 92,852	0.91575 <sup>8</sup>	0.78057 <sup>9</sup>	0.88517 <sup>10</sup>	0.05080	0.07000	0.05000	\$ 703 <sup>11</sup>
2012	82	119,287	\$ 116,993	\$ 112,394	\$ 95,637	94,245	\$ 5,527	\$ 90,111	0.86923	0.68964	0.84302	0.05666	0.07000	0.05000	\$ 575
2013	83	116,889	\$ 114,641	\$ 109,797	\$ 92,814	91,462	\$ 5,632	\$ 87,182	0.81999	0.60929	0.80288	0.06306	0.07000	0.05000	\$ 465
2014	84	114,188	\$ 111,992	\$ 106,942	\$ 89,797	88,490	\$ 5,698	\$ 84,099	0.76827	0.53831	0.76464	0.06948	0.07000	0.05000	\$ 372
2015	85	111,220	\$ 109,081	\$ 103,773	\$ 86,622	85,361	\$ 5,800	\$ 80,822	0.71489	0.47560	0.72823	0.07654	0.07000	0.05000	\$ 294
TOTAL															\$ 4,279
Actuarial Present Value															4.3%

- 1 Notional tier 2 account value at end of prior year (after distribution) increased by 4.00% return for year.
- 2 Average of \$120,000 tier 2 account value at end of prior year (after distribution) and \$124,800 tier 2 account value at end of current year (before distribution).
- 3 \$124,800 Tier 2 account prior to withdrawal reduced 5.06% to reflect withdrawal during 2008(equals withdrawal amount as a percent of tier 1 account prior to withdrawal)
- 4 Notional tier 1 account value at end of prior year (after distribution) increased by 3.00% return for year.
- 5 Average of \$120,000 tier 1 account value at end of prior year (after distribution) and \$124,800 tier 1 account value at end of current year (before distribution).
- 6 December 31, 2008 notional tier 1 account value at end of prior year (before distribution) divided by uniform lifetime table age 78 factor of 19.2
- 7 \$101,500 Tier 1 account prior to withdrawal reduced by withdrawal amount
- 8 Survivorship to start of preceding year (.95936) multiplied by probability of survivorship during prior year (1 - .04546).
- 9 Persistency (not surrendering or annuitizing the policy) at start of preceding year (.88350) multiplied by probability of not surrendering and not annuitizing during prior year (1 - .07000)\*(1 - .05000).
- 10 5.00% discounted 30 months (1.05<sup>-2.5</sup>)
- 11 Probability of annuitization (.05) multiplied by the \$22,219 excess of tier 2 average notional account value over tier 1 average notional account value (\$119,061 less \$96,842), multiplied by .91575 probability of survivorship, .78057 probability of persistence, and 30 month discount factor of .88517.

**2 Tiered Fixed Annuity Example:**

The sample contract provides for a 2nd tier account value applicable only if the contract is annuitized. The 2nd tier credits interest at 4.00% while the standard account value is credited 3.00%. At the end of 2008 the owner has an attained age of 78 and the notional account value is \$120,000. The actuarial present value of the additional benefit through year 2015, which is the last year the contract can be annuitized, is determined to be \$4,279 which equals 4.28% of account value. In making this determination, the following assumptions are made: on average, deaths occur mid-year; the investment return on the notional account value is 3.00% per year; the minimum required distributions (determined without regard to additional benefits under the contract) are made at the end of each year. Because the actuarial present value of the additional benefits is less than 20% of the notional account value and the reduction due to withdrawals is proportional, the exclusion is applicable for 2008. Therefore, the entire interest in the contract may be determined as the notional account value (i.e. without regard to the additional benefits of the 2nd tier).

Appendix H

Example IRS Example of Annuity Persistency Bonus Using Attained Age @ EOY, Projection Rate of 6.5%, & Full Withdrawal Rate of 7%

Gross Return 8.5%  
 Net Return (Projection Rate) 6.5%  
 Discount Rate 5.0%  
 Age as of Val. Date: 72  
 Account Value at end of 2008  
 after withdrawal adjustment  
 (2007 RMD payment) \$500,000.00  
 Date Persistency Bonus Paid 6/1/2016  
 Persistency Bonus % 1.0%  
 Full Withdrawal Rate 7.0%

Year	Age	Persistency Bonus During Year Discounted to 12/31	End-of-Year Notional Account before RMD Withdrawal	Average Notional Account	RMD Withdrawal at End of Year	End-of-Year Notional Account after Withdrawal	Survivorship to Start of Year	Persistence to Start of Year	Interest Discount to End of 2008	Mortality Rate During Year	Full Withdrawal Rate (EOY Decrement)	Discounted Additional Benefits Within Year
2008	72					\$ 500,000						
2009	73	\$0	\$ 532,500 <sup>1</sup>	516,250 <sup>2</sup>	\$ 20,492 <sup>3</sup>	\$ 512,008 <sup>4</sup>	1.000000	1.000000	0.97590	0.02203	0.07000	
2010	74	\$0	\$ 545,289	528,648	\$ 21,788	\$ 523,501	0.97797	0.93000	0.92943	0.02419	0.07000	
2011	75	\$0	\$ 557,529	540,515	\$ 23,062	\$ 534,467	0.95432 <sup>5</sup>	0.86490 <sup>6</sup>	0.88517 <sup>7</sup>	0.02658	0.07000	
2012	76	\$0	\$ 569,207	551,837	\$ 24,517	\$ 544,691	0.92895	0.80436	0.84302	0.02931	0.07000	
2013	77	\$0	\$ 580,095	562,393	\$ 26,062	\$ 554,034	0.90173	0.74805	0.80288	0.03239	0.07000	
2014	78	\$0	\$ 590,046	572,040	\$ 27,564	\$ 562,482	0.87252	0.69569	0.76464	0.03629	0.07000	
2015	79	\$5,658 <sup>8</sup>	\$ 599,043	580,763	\$ 29,296	\$ 569,747	0.84085	0.64699	0.72823	0.04064	0.07000	\$ 2,242 <sup>9</sup>
TOTAL												\$ 2,242
Actuarial Present Value												0.4%

- 1 Notional account value at end of prior year (after distribution) increased by 6.50% return for year.
- 2 Average of \$500,000 account value at end of prior year (after distribution) and \$532,500 account value at end of current year (before distribution).
- 3 12/31/2008 notional account value at end of prior year (before distribution) divided by uniform lifetime table age 72 factor of 24.4
- 4 \$545,289 account prior to withdrawal reduced by the withdrawal amount of \$21,788.
- 5 Survivorship to start of preceding year (.97797) multiplied by probability of survivorship during prior year (1 - .02419).
- 6 Persistence (not surrendering the policy) at start of preceding year (.93000) multiplied by probability of not surrendering during prior year (1 - .07000).
- 7 5.00% discounted 30 months (1.05<sup>-2.5</sup>)
- 8 1.00% of the account value on June 1, 2016 (the December 31, 2015 account value projected forward to June 1, 2016 at the projection rate of 6.50% and discounted back at the 5.00% discount rate).
- 9 Probability of persistence (.64699) multiplied by the discounted persistency bonus of \$5,658, multiplied by .84085 probability of survivorship and the 30 month discount factor of .72823.

Annuity with Persistency Bonus Example:

The sample contract provides for a 1.00% persistency bonus (as a % of account value) payable at a certain date provided the owner is living and has not surrendered the contract on that date. At the end of 2008 the owner has an attained age of 72 and the notional account value is \$500,000. The actuarial present value of the additional benefit at the end of 2008 through year 2015, just prior to the year the persistency bonus is paid, is determined to be \$2,242 which equals .45% of account value. In making this determination, the following assumptions are made: on average, deaths occur mid-year; the investment return on the notional account value is 6.50% per year; the minimum required distributions (determined without regard to additional benefits under the contract) are made at the end of each year. Because the actuarial present value of the additional benefits is less than 20% of the notional account value and the reduction due to withdrawals is proportional, the exclusion is applicable for 2008. Therefore, the entire interest in the contract may be determined as the notional account value (i.e. without regard to the additional persistency bonus).

## Appendix I

The following example shows an annuitization bonus within a variable annuity contract. This feature credits a set percent of that account value at time of annuitization to the amount applied to an income plan. We have assumed that there is no charge to the customer for this feature in this example, and we have assumed 5% of policyholders annuitize each year. "Survivorship" includes policy lapsation, mortality, and annuitization.

Age as of Val. Date: 71  
 Gross Growth: 8.50%  
 Contract Charges: 2.00%  
 Net Growth: 6.50%  
 Ann. Bonus %: 10.00% percentage of AV at annuitization  
 Ann. Bonus Fee: 0.00% annual percentage of average daily AV  
 Annual policy lapsation: 7.00%  
 Annual annuitization: 5.00%  
 Discount Rate: 5.00%

Year	Attained Age EOY	Annuitization Bonus	EOY Notional Acct. before RMD	RMD Withdrawal	EOY Notional Acct. after RMD	Avg. Notional Account	Survivorship Start of Year	Interest Discount	Mortality During Year	APV Ann. Bonus	APV Fee	APV Ann. Bonus - Fee
2005	71	10,000.00			100,000.00		100.00%					
2006	72	10,240.16	106,500.00	4,098.36	102,401.64	103,250.00	91.14%	0.9524	2.20%	444.41	0.00	0.00
2007	73	10,470.02	109,057.75	4,357.52	104,700.23	105,729.69	78.43%	0.9070	2.42%	372.43	0.00	0.00
2008	74	10,689.34	111,505.74	4,612.34	106,893.40	108,102.99	67.35%	0.8638	2.66%	310.96	0.00	0.00
2009	75	10,893.81	113,841.47	4,903.37	108,938.10	110,367.43	57.70%	0.8227	2.93%	258.54	0.00	0.00
2010	76	11,080.67	116,019.08	5,212.35	110,806.73	112,478.59	49.28%	0.7835	3.24%	213.94	0.00	0.00
2011	77	11,249.64	118,009.17	5,512.77	112,496.40	114,407.95	41.96%	0.7462	3.63%	176.14	0.00	0.00
2012	78	11,394.95	119,808.66	5,859.19	113,949.47	116,152.53	35.59%	0.7107	4.06%	144.10	0.00	0.00
2013	79	11,516.33	121,356.19	6,192.91	115,163.28	117,652.83	30.05%	0.6768	4.55%	117.10	0.00	0.00
2014	80	11,610.55	122,648.90	6,543.37	116,105.53	118,906.09	25.24%	0.6446	5.08%	94.44	0.00	0.00
2015	81	11,674.13	123,652.39	6,911.04	116,741.34	119,878.96	21.08%	0.6139	5.67%	75.54	0.00	0.00

## Appendix J

This example shows an Equity Indexed Annuity ("EIA"). We have assumed a 7-year point-to-point EIA contract that is 3 years into the interest credit period. The actuarial present value is being calculated on the accrued, but not yet paid, interest in this contract as of the valuation date. We have assumed that at the time of valuation, \$40,000 of accrued interest exists for this policy and it will only be paid to the extent the policy is maintained in force up until the end of the interest credit period (i.e. the remainder of the 7-year interest credit period). "Survivorship" includes both full policy lapsation and mortality.

Age as of Val. Date: 71  
 Gross Growth: n/a  
 Contract Charges: n/a  
 Net Growth: n/a  
 Total years in interest credit period: 7  
 Years prior to interest credit: 4  
 Discount Rate: 5.00%

Year	Attained Age EOY	Accrued Interest	EOY Notional Acct. before RMD	RMD Withdrawal	EOY Notional Acct. after RMD	Avg. Notional Account	Survivorship Start of Year	Interest Discount	Mortality During Year	APV Acc. Int.
2005	71	40,000.00			100,000.00		100.00%			
2006	72	0.00	100,000.00	4,098.36	95,901.64	100,000.00	91.14%	0.9524	2.00%	0.00
2007	73	0.00	95,901.64	4,080.92	91,820.72	95,901.64	82.89%	0.9070	2.20%	0.00
2008	74	0.00	91,820.72	4,044.97	87,775.75	91,820.72	75.22%	0.8638	2.42%	0.00
2009	75	0.00	127,775.75	4,026.41	123,749.34	107,775.75	68.10%	0.8227	2.66%	22,410.08