ACTUARIAL GUIDELINE XXXV

THE APPLICATION OF THE COMMISSIONERS ANNUITY RESERVE METHOD TO EQUITY INDEXED ANNUITIES

Background

The purpose of this Actuarial Guideline is to interpret the standards for the valuation of reserves for equity indexed annuities. This Guideline codifies the interpretation of the Commissioners Annuity Reserve Valuation Method (CARVM) by clarifying the computational methodologies which will comply with the intent of the Standard Valuation Law (SVL).

Equity indexed deferred annuity products provide policyholders with a minimum guaranteed interest accumulation rate on a portion of all premium payments and a portion of the growth, if any, of an equity based index such as the S&P 500. While there is no "typical" equity indexed product, there are design features that are common to most products. Some of these features are a participation rate guaranteed for one or more years, a cap on the portion of the index growth that is credited to policyholders, and a policy term which defines a time period for which current guarantees are applicable.

Equity indexed immediate annuity products provide policyholders with a minimum guaranteed annuitization rate and an opportunity to receive larger periodic payments based on the growth, if any, in an equity index. The product design may include features such as a participation rate, cap or term.

While contract parameters such as participation rate and cap are guaranteed for a period of time, growth of the underlying index is not. Index growth may be positive or negative. This combination of guaranteed parameters and unknown equity index growth makes the application of CARVM to these products problematic.

CARVM defines minimum statutory reserves as "the greatest of the respective excesses of the present value, at the date of valuation, of the future guaranteed benefits, including guaranteed non-forfeiture benefits, over the present value, at the date of valuation, of any future valuation considerations derived from future gross considerations, required by the terms of such contract, that become payable prior to the end of such respective contract year. The future guaranteed benefits shall be determined by using the mortality table, if any, and the interest rate, or rates, specified in such contracts for determining guaranteed benefits."

In order that all insurers issuing equity indexed annuity products establish reserves for statutory reporting purposes that are consistent with CARVM minimum statutory formula reserves requirements, this Actuarial Guideline identifies a computational method that is deemed to be consistent with CARVM in situations when specific operational criteria called "hedged as required" criteria are met. In addition, two computational methods are defined that are deemed to be consistent with CARVM in the event the "hedged as required" criteria are not met.

Two forms of the "hedged as required" criteria are provided. The "basic" criteria are applicable when an insurer uses long dated options to hedge the equity risk embedded in an equity indexed annuity. The second set of criteria is applicable when an insurer uses an option replication strategy.

Scope

This Actuarial Guideline applies to all equity indexed annuity contracts, regardless of the date of issue, that are subject to CARVM.

Computational Methods

Computational methods deemed to be consistent with CARVM can be classified into two groups, Type 1 methods and Type 2 methods. The following computational method is considered a Type 1 method: the Enhanced Discounted Intrinsic Method (EDIM). Type 1 computational methods are deemed to be consistent with CARVM if the applicable "hedged as required" are met. The following methods are considered Type 2 methods: the Commissioners Annuity Reserve Method with Updated Market Values (CARVM with UMV) and the Market Value Reserve Method (MVRM). Also, an adaptation of the MVRM, known as the Black-Scholes Projection Method (BSPM), is recognized. For a complete description of these methods, please consult Attachment 1.

General Requirements on the Use of Certain Computational Methods

The MVRM and EDIM computational methods are both based on a future value. In the case of MVRM, a projected index is determined. The projected index is then used to determine end of term and interim benefit amounts. CARVM is applied to these benefit amounts. In the case of EDIM, the end of term guaranteed value (a future value) is used to determine an interest rate for calculating terminal reserves for the guaranteed benefits after the initial terminal reserve. Determination of the "term" is an essential component of both computational methods.

The EDIM, MVRM and the BSPM adaptation of the MVRM computational methods are considered acceptable interpretations of CARVM under the following conditions:

1. The policy form design features a single dominant benefit which is the most likely benefit to be provided under the policy form with the determination of the single dominant benefit based on a consideration of product features such as the pattern of guaranteed participation rates, surrender charges, vesting rates, spread deductions, and marketing/advertising material.

2. The point in time associated with the single dominant benefit most likely to be provided under the contract is used as the terminal point of the current term for purposes of applying the computational method and complying with the "hedged as required" criteria, if applicable.

3. The appointed actuary has demonstrated to the satisfaction of the regulatory officials in each state in which the insurer is required to submit a statutory financial statement, prior to the use of the MVRM or EDIM computational methods, that the requirements above have been met.

Variations from the MVRM and EDIM as described in Attachment 1, are not acceptable interpretations of CARVM. The BSPM is considered an acceptable adaptation of the MVRM.

Type 1 Methods

A Type 1 computational method is deemed to be consistent with CARVM if an insurer using the method complies with the applicable "hedged as required" criteria (Attachment 2) and provides a certification as to compliance with the criteria. The certification must be signed by the appointed actuary. The certification shall be provided with each annual and quarterly statutory financial statement filed with the appropriate insurance regulatory official in each state in which the insurer does business.

For purposes of determining compliance with the "equivalence of characteristics" requirement in the "hedged as required" criteria, the current term of an equity indexed deferred annuity policy will be determined based on the requirements in the section captioned "General Requirements on Use of Certain Computational Methods." For purposes of applying a Type 1 computational method, the time horizon for present value calculations should be based on the current term of the policy based on the requirements in the section captioned "General Requirements on Use of Certain Computational Methods."

The Enhanced Discounted Intrinsic Method (EDIM) requires an initial reserve amount that is determined by methods that are not specifically included in the EDIM. For purposes of compliance with statutory minimum formula reserve requirements, the initial reserve under EDIM must be set at least equal to the initial reserve produced by either CARVM with UMV, or the MVRM with assumptions used to compute any necessary option market values reasonable as of the date of issue of the policy. The insurer must provide a certification (Attachment 3) as to the reasonableness of the assumptions.

Type 2 Methods

The use of Type 2 method is not conditioned upon the requirement to meet the "hedged as required" criteria. However, an insurer using a Type 2 method must provide a certification (Attachment 4) signed by the appointed actuary with each annual and quarterly statutory financial statement filed with the appropriate insurance regulatory official in each state in which the insurer does business. This certification deals with the assumptions underlying the option market values included in the calculation of reserves using a Type 2 method and the consistency in assumptions between these option market values and the statement value of any options owned by the insurer to support the equity indexed annuity business being valued.

For purposes of applying the MVRM and the BSPM recognized adaptation computational methods, the time horizon for present value calculations should be based on the requirements in the section captioned "General Requirements on Use of Certain Computational Methods."

Required Change in Method

In the event an insurer that is using a Type 1 computational method for a block of business fails to meet the applicable "hedged as required" criteria, the required actuarial certification must disclose this fact. If the reason for failing the "hedged as required" criteria is not corrected within one quarterly financial reporting of the initial disclosure of the failure in the actuarial certification, the insurer must use a Type 2 computational method for determining minimum statutory formula reserves for this block of business.

If at a later date, the insurer can demonstrate to the satisfaction of its domiciliary commissioner that it is meeting the applicable "hedged as required" criteria, the insurer may, with the approval of the domiciliary commissioner, resume using a Type 1 computational method. In addition, the insurer must notify the appropriate regulatory official in each state in which the insurer does business subject to the change in computational method.

Optional Change in Method

An insurer using either a Type 1 or Type 2 computational method for a block of business, may with the approval of its domiciliary commissioner and after notifying the appropriate regulatory official in all the other states in which the insurer writes this block of business, use a computational method of the other type. If the change in computational methods involves a change from a Type 2 computational method to a Type 1 computational method, the request to the domiciliary commissioner for approval of the change in method must be accompanied with a demonstration of compliance with the applicable "hedged as required" criteria.

Plan Type

The use of either a Type 1 computational method or a Type 2 computational method requires a determination of Plan Type for purposes of determining the maximum valuation interest rate. Design features unique to equity indexed annuities, such as an equity enhanced surrender values, vesting schedules, or participation rate, should not be used to determine the Plan Type of a policy form. Only those design features specifically identified in Section 4b. Paragraph C of the NAIC Model SVL may be used to assign a Plan Type to a policy form.

The definition of Plan Type A and Plan Type B in the NAIC Model SVL includes the phrase "with an adjustment to reflect changes in interest rates or asset values since receipt of the funds by the insurance company..." The reference to "change in ... asset values" does not include changes in policy values due to changes in the equity index underlying the policy form.

Other Regulatory Requirements

The guidance provided in this Actuarial Guideline concerning statutory minimum formula reserves for equity indexed annuity products supersedes the valuation guidance in Sections 5 and 6 of the NAIC Interest-Indexed Annuity Contracts Model Regulation.

Asset Adequacy Testing of Reserves

To the extent required by law, regulation, or regulatory requirements, reserves established for equity indexed annuity policies must be tested for adequacy using appropriate methods and assumptions.

Attachment 1

Description of Computational Methods

<u>CARVM-UMV</u>

Step 1: For each duration and each benefit at which an index-based benefit is available, determine the market value of the appropriate call option. The appropriate call option is one that exactly hedges the floor of the benefit at that point in time. This means that the payoff of the call option should exactly equal the difference between the specific benefit available at that point in time (reflecting all relevant contract features) and the guaranteed floor of that benefit. The market value should be determined using an appropriate option pricing technique, such as Black-Scholes or a stochastic scenario method.

Step 2: The market value of all of the call options are projected forward at the appropriate valuation interest rate to the point in time at which the call option would expire. The valuation interest rate should be consistent with the requirements of any applicable Actuarial Guidelines or regulations, such as Actuarial Guideline 33 or Actuarial Guideline 9-B.

Step 3: The future guaranteed benefits for each benefit at each time point are determined by adding the guaranteed floors of the benefit to the amounts determined in Step 2.

Step 4: Now a CARVM calculation can be performed. The CARVM calculation should be in accordance with Actuarial Guideline 33 and any other applicable regulations or Actuarial Guidelines.

<u>MVRM</u>

Step 1: Calculate the projected index value at the end of the "term" which would produce a benefit at the end of the "term" equal to the sum of (1) the contract guarantee at that time, and (2) the current market value of the call option(s) which would fully hedge the index-based benefit, accumulated at the appropriate valuation interest rate. This calculation should be performed assuming equal annual percentage increases in the index. The call options used are those with maturity dates coterminous with the setting of participation rates, spread, or any other method of determining index-based benefits. The valuation interest rate used to accumulate the call options should be consistent with the requirements of any applicable Actuarial Guidelines or regulations, such as Actuarial Guideline 33 or Actuarial Guideline 9-B. Note that the "term" referred to above should be consistent with the "term" described in Actuarial Guideline ZZZ.

Step 2: From the current level of the index and the projected level of the index at the end of the term, calculate an implied compound constant growth rate of the index from the valuation date to the end of the term. Use this implied growth rate to project the level of the index at intermediate anniversaries.

Step 3: All annuity benefits can now be determined from the index levels.

Step 4: Now a CARVM calculation can be performed. The CARVM calculation should be in accordance with Actuarial Guideline 33 and any other applicable regulations or Actuarial Guidelines.

MVRM Using Black-Scholes Projection Method

This is an adaptation of the basic MVRM approach to accommodate products for which the participation rate, spread, or any other benefit determination method is redetermined during the term (particularly annually).

Step 1: Calculate the cost of a full hedging call option as a percentage of the account value for the period that the benefit determination is guaranteed, accumulate the percentage to the end of that period at the risk-free interest rate, and use the accumulated percentage cost as the projected growth rate of the account value during the period. Perform the same type of calculation for each successive period within the term, giving recognition to the benefit guarantees, forward interest rates, forward index volatility, and index dividend levels.

Step 2: Determine the index level which would provide the projected account level on each anniversary on the basis of the participation rate, spread, or other benefit determination method used.

Step 3: All annuity benefits can now be determined from the index levels.

Step 4: Now a CARVM calculation can be performed. The CARVM calculation should be in accordance with Actuarial Guideline 33 and any other applicable regulations or Actuarial Guidelines.

EDIM

Step 1: The Fixed Component at issue is the formula reserve produced by either CARVM-UMV or MVRM. The Fixed Component at the end of the term is the floor of the benefit actually being hedged.

Step 2: The intermediate values of the Fixed Component are found by solving for an interest rate that would accumulate the initial value to the ending value. For example, assume you purchase options assuming that 90% of policyholders will surrender at maturity, and that 10% of policyholders will annuitize at maturity. The Fixed Component is the sum of (1) 90% of the Fixed Component that grows to the floor of the surrender benefit; and (2) 10% of the Fixed Component that grows to the floor of the annuitization benefit.

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Step 3: The Equity Component is equal to the discounted intrinsic value of the options. The discounted intrinsic value of the options is found by taking the intrinsic value at the valuation date, and discounting at the valuation rate for the number of years from the valuation date to the end of the term. The valuation interest rate used to discount the intrinsic value of the call options should be consistent with the requirements of any applicable Actuarial Guidelines or regulations, such as Actuarial Guideline 33 or Actuarial Guideline 9-B.

Step 4: The reserve is the sum of a Fixed Component and an Equity Component.

Hedged as Required Criteria

In order to use a Type 1 computational method, the appointed actuary needs to certify quarterly that it meets either the "Basic" or "Option Replication" criteria.

Basic

1. Required equivalence of characteristics between the option contracts held and the options imbedded in the products with respect to specific contract features such as: Index, averaging features, option type, strike price, term, etc.

2. The amount of hedge purchased, at or near the contract issuance, must be greater than or equal to a Specified Percentage of the product's account value, at contract issuance. The Specified Percentage varies by the length of the option guarantee (some annual ratchet products may have a term of several years, but the participation rates are only guaranteed for one year, so the "term" for this purpose is 1 year), and allows the company to assume no more than 3% per year of elective benefit decrements, unless the Commissioner agrees to a higher limit. For example, for a five-year point-to-point product, the Specified Percentage would be: $SP\% = (1 - .03) \wedge 5 = 86\%$.

3. The Company must have a specific plan for hedging risks associated with interim death benefits, early surrenders, etc.

4. The Company must have a system in place that is used to monitor the effectiveness of the company's hedging strategy.

5. The Company must have a stated maximum tolerance for differences between the expected performance of the hedge and the actual results of the hedge.

Option Replication

1. Required equivalence of characteristics between the target of an option replication strategy employed, and the options imbedded in the liabilities with respect to specific contract features such as: index, averaging features, option type, strike price, term, etc.

2. At the end of each quarter, the notional amount of the target of the option replication strategy must be greater than or equal to the sum of the Specified Percentages of each contract's account value. The Specified Percentage varies by the length of the remaining option guarantee (some annual ratchet products may have a term of several years, but the participation rates are only guaranteed for one year, so the "term" for this purpose is 1 year), and allows the company to assume no more than 3% per year of elective benefit decrements, unless the Commissioner

agrees to a higher limit. For example, if a point-to-point contract has five years remaining, the Specified Percentage for that contract would be: $SP\% = (1 - .03)^5 = 86\%$. Appropriate assumptions for non-elective decrements such as mortality may be added to the assumption for elective decrements.

3. The company must have a specific plan for hedging risks associated with interim death benefits, early surrenders, etc.

4. The Company must have system in place that is used to monitor the effectiveness of the company's hedging strategy.

5. The Company must have a stated maximum tolerance for differences between the expected performance of the hedge and the actual results of the hedge. The maximum tolerance test and compliance evaluation test must meet the following minimum requirements. The compliance evaluation criteria will be a retrospective correlation test performed at least on a weekly basis. The Company will compare the change in the market value, from the beginning of the calendar quarter, of the hedge portfolio with the change in the market value of the options embedded in the liability portfolio. The maximum dollar amount of difference permitted between these two changes is 10% of the beginning of period market value of the options embedded in the liabilities. If the difference exceeds this limit, the following steps must be taken:

    - If for a second time during a quarter the dollar amount of difference exceeds 10% of the beginning of period market value of the options embedded in the liabilities, but is less than 25% of the beginning of period market value of the options embedded in the liabilities, the Company must notify the Commissioner of Insurance in each state in which the insurer is licensed. The notification must indicate the dollar amount of reserves being hedged by the option replication strategy.

    - If at any of the weekly intervals, the difference between the two changes exceeds 25% of the beginning of period market value of the options embedded in the liabilities, the Company must notify the Commissioner of Insurance in each state in which the insurer is licensed. The notification must indicate the dollar amount of reserves being hedged by the option replication strategy and the impact on surplus of reporting the reserves based on the CARVM-UMV.

- If at any point in time during the quarter the difference between the two changes exceeds 35% of the beginning of period market value of options embedded in the liabilities, the insurer is deemed to be out of compliance with the "hedged as required" criteria, and the Company must notify the Commissioner of Insurance in each state in which the insurer is licensed. The notification must indicate the dollar amount of reserves being hedged by the option replication strategy and the impact on surplus of reporting the reserves based on the CARVM-UMV.

Drafting Note: The requirements discussed above deal with the situation in which the actual hedge underperforms relative to the expected hedge performance. The ability of an insurer to over-hedge may be constrained by other components of a state's regulatory framework including the state's investment article and regulations concerning the use of derivative instruments. For purposes of this Drafting Note, over-hedged means that at a particular point in time, the hedge portfolio exceeds the portfolio of liabilities being hedged. If over-hedged, the excess hedging instruments are excluded from the measurements required in Item 5 of the hedged as required Criteria.

Attachment 3

Reasonableness of Assumptions Certification

The following certification must be filed in conjunction with each quarterly and annual statutory financial statement filed with the appropriate regulatory official in each state in which the insurer does business. The certification must be signed by the appointed actuary.

I, (state name and professional designation), am the appointed actuary for (company name). I have reviewed the assumptions underlying the values assigned to all equity options used in the determination of the initial statutory reserves under the Enhanced Discounted Intrinsic Method for all equity indexed deferred annuity products issued or reinsured by (company name) and reported in the statutory financial statement as of (the date of valuation). The assumptions used to determine such option market values are reasonable in light of the relevant economic conditions prevalent at the time of issue of each policy valued using the Enhanced Discounted Intrinsic Method.

_____
(Name of actuary)

_____
(Signature of actuary)

_____
(Date of certification)

Reasonableness and Consistency of Assumptions Certification

The following certification must be filed in conjunction with each quarterly and annual statutory financial statement filed with the appropriate regulatory official in each state in which the insurer does business. The certification must be signed by the appointed actuary.

I, (state name and professional designation), am the appointed actuary for (company name). I have reviewed the assumptions underlying the values assigned to all equity options used in the determination of statutory reserves for all equity indexed annuity products issued or reinsured by (company name) insurance company and reported in the statutory financial statement as of (the date of valuation). The assumptions used to determine such option market values are:

1. reasonable in light of current relevant economic conditions as of the date of valuation, and

2. are consistent with the comparable assumptions used to determine the statement value of any derivative instruments used to hedge the equity indexed based obligations embedded in the equity indexed annuities subject to this certification

_____

(Name of actuary)

_____

(Signature of actuary)

_____

(Date of certification)