AMERICAN ACADEMY *of* ACTUARIES

# Report of the American Academy of Actuaries Variable Life Reserving Guideline Work Group To the NAIC's Life and Health Actuarial Task Force Atlanta – October, 1999

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The Academy's Variable Life Reserve Guideline Work Group of the Committee on State Life Insurance Issues prepared this report.


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**Background**

At the March NAIC meeting, members of the NAIC Life and Health Actuarial Task Force (LHATF) asked the Academy of Actuaries (AAA) to assist LHATF in identifying the proper basis for reserving for Guaranteed Minimum Death Benefits (GMDB) contained in Variable Life (VL) products, which would provide the basis for an Actuarial Guideline. Steve Preston, Chair of the AAA Life Committee asked Burt Jay to form an AAA Working Group to complete this assignment. This Work Group is known as the Variable Life Reserve Work Group (VLRWG). The VLRWG defines GMDBs as any benefit that guarantees that a policy will remain in-force regardless of whether the policy value is less than or equal to zero, or a benefit that guarantees that the death benefit will not fall below the initial death benefit for the life of the policy or for any stated period.

The VLRWG made several recommendations at the June meeting of the NAIC LHATF.

- The valuation requirements for GMDBs in VL contracts should be described in an Actuarial Guideline which interprets the Standard Valuation Law (SVL), rather than the Model Variable Life Regulation (MVLR).

- The Guideline should contain the following requirements for the basic reserves for VL contracts: "Reserve Liabilities for variable life insurance policies shall be established consistent with the methodologies described in Standard Valuation Law and in accordance with actuarial procedures that recognize the variable nature of the benefits provided and any mortality guarantees."

- The Guideline should require additional reserves for GMDBs contained in VL contracts equal to the greater of 1) "the aggregate total of the term costs" (1YT), which covers a period of no more than one year following a 1/3 drop in the account value, and 2) "the attained age level" reserve (AALR), which covers the entire period of the guarantee, but requires no immediate drop in account value.

The new Guideline should be consistent with the valuation requirements of the 1983 and 1989 versions of the VL Model Regulation. The new Guideline should also clarify and expand on a number of provisions contained in the VL Model Regulations where current interpretations are believed not to be consistent by companies reserving for VL products. The LHATF accepted the report of the VLRWG and requested that a Guideline based on the recommendations stated above be drafted for consideration at the October meeting of the LHATF along with several examples of the reserves that would be established in accordance with the proposed Guideline. Such a Guideline has now been drafted, along with the examples requested, for presentation and discussion at the October meeting.

The proposed Guideline specifies the details for calculating reserves for both "traditional" VL policies, where a premium is specified and the death benefit, reserve and cash value vary according to the relationship of the actual rate of return on a separate account compared to an Assumed Interest Rate (AIR), and "non-traditional" VL policies, which are based on a universal life (UL) design, which guarantees that the death benefit will remain level for a specified number of years as long as a specified payment is made during that period. The proposed Guideline stipulates that Basic Reserves be held for death benefits provided in the absence of a GMDB and should be established consistent with the Standard Valuation Law, Variable Life Model Regulation, Universal Life Insurance Model Regulation and the Valuation of Life Insurance Policies Model Regulation.

The GMDB reserves provide for the death benefits guaranteed over and above those benefits that would be required in the absence of the guarantee. The proposed Guideline specifies that the greater of a One-Year Term Reserve (OYT) and an Attained Age Level Reserve (AALR) be established for the GMDB.

The OYT component equals the present value of any additional death benefits provided by the GMDB for one full year or the end of the guarantee period if sooner. It is calculated by projecting the policy value following a 1/3-asset drop to determine the death benefit in the absence of the GMDB. If this death benefit is less than the GMDB, the OYT reserve is the present value of the difference using valuation mortality rates and maximum valuation interest rates.

The AALR component allows for funding the reserves for GMDBs over the entire guarantee period and is based on the excess of the GMDB over the death benefit that would be required without the guarantee. The calculation takes the previous year's AALR into account and is the present value of the future additional death benefits remaining on the valuation date less the accumulation of the previous AALR less the present value of a payment sufficient to fund the prior difference over the remaining period of the guarantee.

Over the past three months the VLRWG has considered several issues, one of which is still unresolved. Guidance from the LHATF is requested on the first issue.

1. In the calculation of the AALR the VLRWG is proposing two alternative interpretations for the determination of the present value of additional death benefits. The proposed Guideline refers to the calculation of (A) minus (B) minus (C), where: (A) is the present value of future guaranteed minimum death benefits. (B) Is the present value of the death benefits that would be provided in the absence of the guarantee. (C) Is the residual from the previous year's AALR. The unresolved issue is whether or not the calculation of (A) minus (B) can take credit for periods when the death benefit provided without the guarantee exceeds the death benefit specified by the GMDB. Two versions for the Guideline are being presented for consideration, version X and version Y. The VLRWG is equally divided on which of these interpretations is most appropriate. Version X would allow only positive excesses of the GMDB over the death benefit without the guarantee to be discounted to calculate (A) minus (B). Version Y would discount both positive and negative values of the excess death benefit, even for periods beyond the guarantee period when the GMDB becomes zero.

2. After much discussion and deliberation the VLRWG recommends that the Guideline should apply to all in-force VL business, with a 3-year transition period if approved by the domicilliary Insurance Commissioner. The AALR calculation for a company's in-force VL business would include any residue held on the year-end before this Guideline becomes effective.

3. The VLRWG considered single premium forms of VL policies but discovered nothing that suggested that special treatment of these policies in the Guideline was warranted.

4. The current guideline recommended by the Working Group was originally intended to address concerns about secondary guarantees on variable life plans. Many

individuals felt that the Variable Life Model Regulation was sufficient to address these types of guarantees and that it was not necessary to include variable life business in the Valuation of Life Insurance Policies Model Regulation (XXX).

As we near completion of our work the Working Group recognizes that the guideline adequately addresses appropriate reserves for the vast majority of current variable life policy designs with secondary guarantees. However, we recognize that there are product designs which if developed could theoretically result in very minimal reserves being held. Illustrating a simplified example of such a design is a flexible premium variable life plan, which looks exactly like a level premium term plan. In this design, the guaranteed charges are just less than the term premium. Assume the term premium is guaranteed level for 35 years and the death benefit is guaranteed if such premiums are paid. Additional premium could be paid, however the charges associated with premiums above the level term premium are significant enough to deter any additional investment.

For this type of plan, very little account value is created, thus if basic reserves are determined by the Universal Life Model Regulation reserve methodologies, the r-factor is close to zero, thus minimum basic reserves are held. Using the Variable Life Model Regulation AALR reserve methodology interpreted consistent with the proposed Guideline, AALR reserves are avoided as guaranteed minimum death benefits with the guarantee and minimum guaranteed death benefits without the guarantee are equal and no additional reserves results. Under the Valuation of Life Insurance Policies Model Regulation, hump-back term reserves are created.

Thus determining reserves for this type of design using existing regulation and this Guideline, statutory reserves can be very low. This assessment does not consider any additional reserve needed to satisfy Appointed Actuary requirements.

We believe the proposed Guideline greatly improves the consistency of interpretation of the Standard Valuation Law for variable life products and should be adopted. However, the VLRWG was able to identify a variable life product design where a level death benefit would be provided for a stipulated level payment by a policyholder for a period of several years that would not develop reserves for a GMDB under this proposed Guideline. The additional cost of selling variable life may be a barrier to these types of products (SEC, NASD, registered reps, and prospectus); however, market forces may lead companies to overcome these barriers. The Work Group believes that such products do not exist today and that to address possible abuses of these potential product designs will require a significant new project.

This report includes attachments which contain the proposed Guideline and the examples based on a number of rates of return, payment scenarios and plan designs. The Academy VLRWG appreciates this opportunity to assist the NAIC with this project and would be pleased to continue to work with the LHATF with any follow-up desired.

**Actuarial Guideline ????**
**Variable Life Insurance Reserves for Guaranteed Minimum Death Benefits**

**Background:**

This guideline's primary focus is to clarify the appropriate projection assumptions and methodologies used to determine statutory reserve liabilities for Guaranteed Minimum Death Benefits (GMDBs) offered with variable life insurance products.

For many years, insurance companies have not applied uniform reserve standards to variable life insurance policies in general, and to GMDBs in particular. Four regulatory sources are often looked to for guidance. First, the Standard Valuation Law (SVL) requires that CRVM be based on the present value of future guaranteed benefits. Second, the Variable Life Insurance Model Regulation as revised in 1983 and again in 1989 states "Reserve liabilities for variable life insurance policies shall be established under [SVL] in accordance with actuarial procedures that recognize the variable nature of the benefits provided and any mortality guarantees." Third is the Universal Life Insurance Model Regulation and most recently the Valuation of Life Insurance Policies Model Regulation.

GMDBs are common features of variable life products. Recently, reserve methods for universal life secondary guarantees have been clarified in the Valuation of Life Insurance Policies Model Regulation. These secondary guarantees are similar to GMDBs offered with variable life policies. A Guaranteed Minimum Death Benefit is any guarantee which provides death benefit protection which would not otherwise be provided in the absence of such a guaranteed benefit or provision. An example of a GMDB is a policy in which death benefits continue in-force even if the policy value is zero. This benefit may be contingent on additional qualifications being met, such as cumulative premiums meeting some limit.

Additional examples of GMDBs are provided below. This list is not intended to include all types of GMDBs.

- A Minimum Death Benefit Provision or No Lapse provision where death benefits are guaranteed to remain in-force for a period of time even if the policy value is not greater than zero subject only to certain conditions being met such as cumulative premiums meeting a minimum amount, or if a theoretical account value is sufficient to meet a minimum amount.

- Death Benefits that are guaranteed to be at least as large as the original face amount, regardless of investment performance which might generate negative Paid Up Additions on a traditional fixed premium variable life insurance policy.

The Variable Life Insurance Model Regulation defines the reserve methodology for variable life policies. However, currently two versions of the model regulation exist and this results in inconsistent treatment by state. These two versions include the 1983 revisions and the 1989 revisions to the model regulation. Many states have not passed either revision and therefore require direct interpretation of SVL. In practice, companies have interpreted these regulations inconsistently with regard to assumptions and/or application to current products available today. The 1983 version of the regulation treats flexible premium policies differently than scheduled premium policies. The 1983 version of the regulation did not anticipate the types of GMDBs available today which require contingent conditions to be met to maintain a death benefit guarantee, for instance specified premiums must be paid. Thus, confusion exists with regard to which valuation method is appropriate. The 1989 version makes no distinction between the scheduled premium and flexible premium policies.

This Guideline codifies the basic interpretation of reserve liabilities for variable life GMDBs by clarifying the projection assumptions and methodologies that comply with the SVL. Minimum valuation standards that may be used to determine this reserve and are not specifically addressed in this guideline are defined by SVL and other applicable state regulations. This guideline focuses on the methodology of the 1989 revisions to interpret SVL, as we believe the 1989 revision more appropriately considers the types of products and GMDBs available today.

Interpretations of both the 1983 and 1989 versions reflect the comments made in the December 1972 report which concluded that an acceptable GMDB reserve system should have the following characteristics:

1. The GMDB reserve should be held in the general account of the company so that it will be backed by the general assets of the company, most of which are debt obligations valued at amortized cost and, therefore, are of a fixed dollar nature. It would not be proper to hold the GMDB reserve in the separate account, assuming the reserve is not supported by fixed dollar assets but by assets that are moving in the opposite direction from the risk, i.e. value moving downward while the risk increases and vice versa.

2. The GMDB reserve should be adequate to cover the GMDB death claims for the next year in all but the most extreme circumstances so that the regulatory authorities can be assured the company will not run into financial trouble from this source before the next annual statement is filed.

3. The GMDB reserve should react slowly but steadily through an extended period of poor investment experience of the separate account.

4. The GMDB reserve should not cause unnecessary fluctuations in surplus by increasing too rapidly in a sharp market downswing. Also, the reserve should not decrease too rapidly in a sharp market upswing after a period of poor market performance.

This guideline maintains the four principles above in interpreting the Standard Valuation Law as it relates to variable life business and the methods defined in both the 1983 and 1989 versions of the Variable Life Insurance Model Regulation.

Reserve methodologies which recognize the variable nature of GMDB are defined in the Variable Life Insurance Model Regulation and include a One-Year Term reserve recognizing a 1/3 drop in account values, the Attained Age Level Reserve (AALR) methodology and in the 1983 version, a methodology for flexible premium policies. Reserves for GMDBs are held in the general account.

This guideline recognizes the following principles when determining appropriate reserves for GMDB.

- Determine the guaranteed death benefits which are not valued in the basic policy reserves.

- Establish a reserve for these benefits over the period of time in which revenue is collected to pay for such benefits; however, no greater than the period of time these guaranteed benefits are provided.

- Collected revenue should not be de-minimus in order to reduce the reserve.

- The reserve established is in addition to basic reserves.

This guideline interprets the standards for applying these methodologies. This guideline also interprets the projection assumptions to be applied to determine excess guaranteed death benefits. The guideline clarifies the use of the AALR methodology for flexible premium variable life policies with contingent GMDB benefit structures similar to specified premium contracts. This guideline is based on the belief that the 1983 revisions did not anticipate these types of GMDB benefits on flexible premium contracts. Thus, it makes sense to interpret the 1983 revisions for these types of GMDB benefits by applying the AALR methodology when there is a contingent GMDB structure. For flexible premium plans with other types of GMDBs, the flexible premium language of the 1983 revision is used where applicable. Reflecting a 1/3 drop in asset values is used only to develop a one-year term reserve.

The AALR methodology, along with the one-year term reserve is generally consistent with the principles above in that additional reserves are established in recognition of all death benefit guarantees not reflected in basic reserves. If multiple guarantees exist all guarantees must be valued and the greatest additional reserve is held. Consecutive GMDBs are treated as a single guarantee. These reserves are funded over the period of time GMDB Revenue will be collected through either policy charges or premiums, however, not to exceed the GMDB benefit period. The AALR methodology funds any GMDB Revenue deficiency over the period of time the Revenue is collected, however, no longer than the end of the guarantee period.

GMDB reserves are held in addition to basic reserves unless the appointed actuary provides satisfactory documentation to the state of domicile insurance department stating why such reserves are redundant. For example, for traditional variable life product designs where reserves are generally determined on a tabular basis and use an assumed interest rate (AIR), if basic reserves are determined based on at least the guaranteed face amount, (i.e. ignoring any negative additions) then the guaranteed death benefit is fully reflected in the basic reserves; therefore, an additional GMDB reserve is redundant. Neither this guideline nor the 1989 amendments specifically address traditional variable life product designs, nor does this guideline specifically exclude these designs from its scope.

**SCOPE**

The guideline applies to all variable life insurance contracts to which the Standard Valuation Law applies and which provide Guaranteed Minimum Death Benefits (GMDBs) either explicitly or implicitly.

**Definitions:**

**Asset Based Charges:** Asset based charges includes all charges that are expressed as a percent of account value.

**Attained age level reserve (AALR):** The AALR is a methodology described in the 1983 and 1989 revisions to the Variable Life Insurance Model Regulation.

**Catch-up provision**: A Catch-up provision is a provision in the policy that gives the policyholder the right to catch up on any contingent requirements in order to maintain the GMDB.

**Guaranteed Period:** The guaranteed period is the period of time over which a GMDB is guaranteed regardless of the basic guarantees in the policy. A policy may have multiple guaranteed periods and GMDBs.

**Guaranteed Minimum Death Benefit (GMDB):** A Guaranteed Minimum Death Benefit (GMDB) is any guarantee which provides continued death benefit protection which would not otherwise be provided in the absence of such a guaranteed benefit or provision. A policy may have multiple GMDBs.

**One-Year Term (OYT) reserve:** The OYT reserve covers a period of no more than one year following a 1/3 drop in the account value. This reserve is fully described in the 1989 revision to the Variable Life Insurance Model Regulation. This guideline clarifies the methodology and the assumptions used to determine OYT reserves.

**Projection Assumptions:** The Projection Assumptions are used to determine guaranteed death benefits. This projection of policy values uses the following assumptions:

1. Guaranteed cost of insurance rates are used.
2. Guaranteed policy charges are utilized including: guaranteed sales charges, guaranteed administrative charges and other guaranteed policy charges excluding asset based charges.
3. Contingent requirements to maintain the GMDB are assumed to be met on the valuation date as well as in subsequent years. To the extent contingent requirements are prepaid, future contingent requirements as assumed to be met in the future until they are required to maintain the GMDB.
4. The general account policy values and separate account policy values are projected at the valuation interest rate. The assumed interest rate, if any, is used when determining the OYT reserve.
5. The guaranteed period covered is determined assuming all contingent requirements are met.
6. Policy options and benefits are assumed to continue unchanged as of the valuation date. Examples include fixed and variable account allocation and the death benefit option.

**GMDB Revenue:** GMDB Revenue is policy charges or premium, either implicit or explicit. These charges or premiums may or may not be explicitly stated to cover GMDB benefits. An example of an implicit premium is a positive premium necessary to maintain a target account value in order to maintain benefits.

**Separate Account Death Benefit (SADB):** The SADB is the death benefit that would be payable in absence of the GMDB.

**Term cost:** Term costs are based on the guaranteed minimum death benefits in excess of the death benefits that would be provided in absence of such guarantee based on a projection of policy values using the Projection Assumptions defined above. These costs are then discounted to the valuation date. The term costs are based on minimum valuation mortality standards and a discount rate not to exceed the maximum valuation interest rate.

**1/3-Asset Drop:** A 1/3 reduction in separate account values that is used in the calculation of the one-year term reserve. This 1/3 drop is not applied to fixed account values.

**Text:**

1. Basic Reserves:

Basic Reserves include the reserve held for death benefits provided in the absence of a GMDB. Reserve liabilities for variable life insurance policies shall be established consistent with the methodologies described in the Standard Valuation Law and in accordance with actuarial procedures that recognize the variable nature of the benefits provided and any mortality guarantees. Reserve methods described in the Variable Life Insurance Model Regulation and the Universal Life Insurance Model Regulation may be appropriately utilized to determine reserve liabilities such that application of these methods is consistent with the principles of the Standard Valuation Law.

2. Guaranteed Minimum Death Benefit Reserves:

Additional reserves are required to provide for liabilities of GMDB provisions which provide benefits that would not be provided in the absence of the guarantee. In measuring these liabilities, the basic reserve provides for death benefits which occur in the absence of the guarantee. GMDB reserves provide for the contingency of death occurring when the guaranteed minimum death benefit exceeds the death benefit that would be paid in absence of the guarantee. A consistent reserve methodology should be used regardless of whether a contract has scheduled premiums or flexible premiums.

When a contract provides multiple GMDBs and/or multiple guarantee periods, a reserve is established based on the guaranteed period which produces the greatest reserve as of the valuation date. Consecutive GMDBs are treated as a single guarantee period. The reserve methodology reflects all potential guarantee periods assuming that contingent requirements are met such as: contingent premiums paid, Catch-up Provisions or any pre-funding of contingent requirements.

For a policy under the 1989 revisions or a flexible premium policy with contingent GMDB similar to specified premium contract under the 1983 revision, the GMDB reserve equals the greater of (1) and (2) where (1) equals “the aggregate total of term costs” (OYT) which covers a period of no more than one year following a 1/3 Asset Drop in the separate account value, and (2) equals the AALR as described below.

For a flexible premium policy under the 1983 revisions not covered above, the GMDB reserve equals the greater of (1) and (2) where (1) equals “the aggregate total of term costs” which covers a period of no more than one year following a 1/3 Asset Drop in the separate account value, and (2) equals the AALR as described below.

a) One Year Term Reserves (OYT):

This reserve component equals the "aggregate total of term costs", if any, covering a period of one full year from the valuation date, or, if less, covering the period of time death benefits are provided which are not otherwise provided for by the basic reserves. This reserve assumes any contingent requirements to maintain the GMDB are met by reflecting any Catch-up Provisions or any pre-funding of contingent requirements.

"Aggregate total term costs" equals the present value of guaranteed minimum death benefits in excess of death benefits that would be provided in absence of such guarantee, if any, prior to the end of one full year or the end of the guaranteed period if sooner. Death benefits are determined by projecting the policy value following a 1/3 -Asset Drop and using the Projection Assumptions defined above. Present values are determined using valuation mortality rates and the maximum valuation interest rate.

b) Attained Age Level Reserves (AALR):

This reserve component allows for funding GMDBs over no longer than the guaranteed period. This reserve assumes contingent requirements are met to maintain the GMDB and reflect any prepaid contingent requirements or Catch-up provisions. This reserve component exists until no later than the end of the guarantee period if, on any prior valuation, date projected policy values resulted in guaranteed minimum death benefits in excess of death benefits that would be provided in absence of such guarantee. To the extent long term favorable investment performance results in redundant reserves, the valuation actuary may request permission from the state of domicile insurance department to release all or a portion of the redundant GMDB reserves. This projection of account value assumes no 1/3-Asset Drop and the Projection Assumptions defined above.

The AALR reserve component shall not be less than zero and shall equal the "residue," as described in paragraph (1) below, of the prior year's AALR on the contract, with any such "residue," increased or decreased by a "payment" computed on an attained age basis as described in paragraph (2) below.

(1) The "residue" of the prior year's AALR on each variable life insurance contract shall not be less than zero and shall be determined by adding interest at the maximum valuation interest rate to such prior year's reserve, deducting the tabular claims based on the "excess", if any, of the guaranteed minimum death benefit over the death benefit that would be payable in absence of such guarantee, and dividing the result by the tabular probability of survival. Hence, tabular costs are only deducted for years where, in the absence of the guarantee, coverage would be less than the guaranteed coverage.

**Version X** *[ (A)-(B) not allowed Negative]*

(2) The "payment" used to increase or decrease the "residue" above shall be computed so that the present value of a level payment of that amount each year over the future period for which GMDB Revenue will be collected under the contract is equal to (A) minus (B) minus (C), where, (A) is the present value of future guaranteed minimum death benefits. The future guaranteed minimum death benefits are the projected future death benefits including the GMDB. (B) is the present value of the projected future death benefits that would be payable in the absence of the GMDB. The guaranteed benefit for (A) and (B) should be calculated for the life of the policy. Both (A) and (B) are calculated based on the Projection Assumptions.

*This results in A-B equal to the PV of the guaranteed death benefit in excess of the death benefit that would be provided in absence of such guarantee. Thus A-B is never less than zero.*

(C) is any "residue," as described in paragraph (1) above, of the prior year's AALR on such variable contract. Minimum standards of valuation mortality assumptions and maximum valuation interest rates are used to determine present values and net level payments. The period of time in which GMDB Revenue will be collected is limited to the period of time policy values are sufficient to collect policy charges or the period of time contingent requirements will be paid to maintain the GMDB. In no event will the time period be greater than the time to the end of the guarantee period. It should also be noted that the "payment" may be negative resulting in the reserve running off over the remaining guarantee period.

**Version Y** *[ (A)-(B) allowed Negative]*

(2) The "payment" used to increase or decrease the "residue" above shall be computed so that the present value of a level payment of that amount each year over the future period for which GMDB Revenue will be collected under the contract is equal to (A) minus (B) minus (C), where, (A) is the present value of future guaranteed minimum death benefits. The future guaranteed minimum death benefit is the GMDB. This is not determined based on a projection. (B) is the present value of the projected future death benefits that would be payable in the absence of the GMDB. The benefits specified in (B) are calculated for the life of the policy based on the Projection Assumptions.

*This results in A-B equal to the difference between two present values, thus A-B can be negative.*

(C) is any "residue," as described in paragraph (1) above, of the prior year's AALR on such variable contract. Minimum standards of valuation mortality assumptions and maximum valuation interest rates are used to determine present values and net level payments. The period of time in which GMDB Revenue will be collected is limited to the period of time policy values are sufficient to collect policy charges or the period of time contingent requirements will be paid to maintain the GMDB. In no event will the time period be greater than the time to the end of the guarantee period. It should also be noted that the "payment" may be negative resulting in the reserve running off over no later than the remaining guarantee period.

c) Other Flexible Premium Policies under the 1983 revisions not included above:

The present value of potential guaranteed minimum death benefits in excess of death benefits that would be provided in absence of such guarantee is determined by using minimum standards of valuation mortality assumptions and maximum valuation interest rates.

**Effective Date:**

This guideline affects all variable life insurance contracts issued. Where the application of this Guideline produces higher reserves than the company had otherwise established by their previously used interpretation, such company must comply with this guideline effective December 31, XXXX. However, such company may request a grade in period, not to exceed three (3) years, from the domiciliary Commissioner upon satisfactory demonstration of the previous interpretation and that such delay of implementation will not cause a hazardous financial condition or potential harm to its policyholders.

Application of this guideline to in-force policies to develop the current residue portion of the AALR may not be feasible, as such future payments as defined in the AALR methodology will based on the residue, if any, as of 12/31/XXXX.