January 5, 2015

Mr. Mark Birdsall
Chairman – Life Risk Based Capital (E) Working Group

Mr. Tomasz Serbinowski
Chairman – CDA (LATF) Subgroup

Re Reserve Considerations for CDA

Dear Mr. Birdsall and Mr. Serbinowski:

The ACLI1 and Insured Retirement Institute (IRI) are submitting the attached paper on behalf of our joint CDA working group. This paper is intended to identify and illustrate the considerations for establishing reserves and RBC within the AG-43/C3P2 framework for a CDA relative to a Variable Annuity with guaranteed income benefits.

We are presenting this paper in response to certain discussions at the Life RBC Working Group, but the issues naturally apply to both reserves and RBC. We believe that both groups can benefit from this analysis.

We will be happy to discuss these comments and answer any questions.

Jason Berkowitz
Vice President, Regulatory Affairs and Compliance
Insured Retirement Institute (IRI)
202-469-3014
jberkowitz@irionline.org

John Bruins
Vice President & Senior Actuary
American Council of Life insurers
202-624-2169
johnbruins@acli.com

Cc Dave Fleming, NAIC
Reggie Mazyck, NAIC

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1 The American Council of Life Insurers (ACLI) is a Washington, D.C.-based trade association with more than 300 legal reserve life insurer and fraternal benefit society member companies operating in the United States. ACLI advocates in federal, state and international forums. Its members represent more than 90 percent of the assets and premiums of the U.S. life insurance and annuity industry. In addition to life insurance, annuities and other workplace and individual retirement plans, ACLI members offer long-term care and disability income insurance, and reinsurance. Its public website can be accessed at www.acli.com.
Contingent Deferred Annuity Reserving Considerations

The statutory reserve guidance applicable to CDAs is provided by Actuarial Guideline XLIII (AG 43), a principle-based reserve standard. Given its anchoring in fundamental actuarial and financial modeling principles rather than formulaic rules and static assumptions, AG 43 is flexible and applicable to many variations of annuity product design. As with the other annuity products with guaranteed benefits which are valued according to AG 43, we believe that the guidance is suitable for CDAs and many other potential annuity product variations, so long as the principles of the guidance are applied appropriately by the actuary, with prudent estimate assumptions and other requisite modeling considerations, and in accordance with applicable Actuarial Standards of Practice.

This memo provides a discussion of key modeling considerations for CDAs with respect to AG 43 reserve guidance.

Modeling assumptions

There are considerable similarities between CDAs and VA GLWBs in the purpose, design, policyholder base, and expected use of the products. Because of that, there are considerable similarities in the modeling assumptions used to value these products. Assumptions for CDAs would likely be developed based on VA GLWB assumptions, with targeted modifications in order to reflect known or expected differences in product design features or restrictions, specific characteristics of the insured population, distribution method, and other key drivers. Key modeling assumptions for these products include:

- **Mortality** – CDA mortality would generally be expected to be similar to VA mortality, given similarities in the demographics of the policyholder base.
- **Base Lapse** – Lapse rates are typically driven by the surrender charge schedule of the annuity contract, remaining low in early years, increasing slightly to the end of the surrender period, experiencing a “shock lapse” in the first year after the surrender period, and “stabilizing” at a low to moderate ultimate lapse rate thereafter. (Note that the presence of a guaranteed benefit also has an impact on lapse behavior, discussed below.) CDAs do not have a surrender charge schedule, but some CDA designs may include a cancellation fee which could impact lapse patterns for the product. Base lapse rate assumptions for CDAs would reflect expected differences in behavior resulting from product design, distribution method, and policyholder characteristics, as applicable.
- **Dynamic Lapse** – Products with minimum guarantees such as GLWBs and CDAs typically provide customers with a benefit base that could exceed the account value to which the guarantees relate. This “in-the-moneyness” creates an incentive for policyholders to retain their contract. The more in-the-money a contract is, the less likely it is to lapse, all else being equal. Insurers recognize this behavioral phenomenon and reflect it with a dynamic function or adjustment factor applied to Base Lapse rates for VA GLWBs. It is reasonable to expect that the same behavioral drivers would apply to CDAs.
- **Benefit Utilization** – An important behavioral assumption for lifetime withdrawal benefit guarantees is the timing and amount of withdrawals electively taken by policyholders. This behavior is driven by a number of factors, including product design, policyholder financial needs and goals, other sources of income, taxes, distribution method, and other drivers. As with Dynamic Lapse above, it is expected that the same key drivers would impact utilization behavior for CDAs, and so benefit
utilization assumptions would generally be similar between CDAs and VA GLWBs (adjusted for design differences as appropriate).

**Fund investment management fees** – Investment management fee assumptions for projecting funds available with CDAs would be developed in the same manner as those of funds available with VAs, based on the stated management fees for the covered funds.

**Net revenue sharing income** – With VAs, insurers typically have “revenue sharing” agreements (e.g., sub-transfer agreements, administrative services agreements) associated with the externally-managed funds held in subaccounts on the insurance company Separate Account platform. Given the nature of typical CDA models, in which assets are held and managed by an entity other than the issuing insurance company, it is likely that the insurer does not receive revenue sharing income on CDA covered assets. Should business models exist in which revenue sharing agreements are made between the CDA issuer and the asset manager, the insurance company would reflect net revenue sharing in valuation as per AG 43 guidance. This requires that, among other things, the net revenue sharing assumption includes a margin for uncertainty based on factors specified in the guidance.

As with other products, experience monitoring for CDAs would be used to inform the assumption-setting process on an ongoing basis.

### Asset modeling, scenario generation, and calibration

Due to similarities in the assets typically covered by GLWBs and CDAs, consistent methodologies would be employed for modeling the assets. AG 43 provides guidance and establishes certain requirements for the stochastic scenarios used to simulate fund performance and interest rates. This includes guidance regarding:

- Calibration requirements
- Modeling funds and mapping to indices / asset classes
- Correlation of funds and indices
- Number of scenarios and efficiency in estimation
- Frequency of projection and time horizon

The American Academy of Actuaries (AAA) publishes 10,000 "pre-packaged" scenarios for 19 different asset classes and Treasury maturities for use in the stochastic calculations required under AG 43 and C-3 Phase II. The actuary may use these AAA scenarios, or other models that the actuary deems appropriate, to develop stochastic scenarios of fund performance. It is typical to use a representative subset of the stochastic scenario set in the model projections (1,000 is common practice). Typically assets are not explicitly modeled; rather, VA Separate Account assets and CDA covered funds alike are mapped to the appropriate asset classes or indices.

The methods used to develop the stochastic scenarios must be described in the Actuarial Memorandum. This includes descriptions of the models used to develop returns and interest rates, any statistical sampling methods employed for selecting the scenario set, and the variable fund mapping process.

The actuary must certify that the indices modeled provide a reasonable representation of the actual funds underlying the products being valued, and that the stochastic scenarios satisfy the calibration criteria described in the guidance.
For both VA GLWBs and CDAs, surplus assets are held in the insurance company's General Account.

Differences exist between VA GLWBs and CDAs in the location of policyholder covered assets. Covered assets associated with VA GLWB are invested in the various subaccounts selected by the policyholder, held in insulated Separate Accounts of the insurance company. Covered assets associated with the CDA are held at the asset management company and invested in the various funds and programs available for selection with the CDA. The table below provides further detail on the nature of the covered assets typically associated with VA GLWBs and CDAs. These characteristics would be considered by the actuary when determining the appropriate indices and asset assumptions to apply in AG 43 valuation.

<table>
<thead>
<tr>
<th>Location of Covered Assets</th>
<th>Variable Annuity with GLWB</th>
<th>CDA</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Insurance company – insulated Separate Account</td>
<td>Outside firm responsible for managing the assets in accordance with investment guidelines, typically in a fiduciary capacity for the owner of the assets (“investment manager”)</td>
</tr>
<tr>
<td></td>
<td>- Insurance company proprietary funds</td>
<td>- Retail market: Financial institution (e.g., bank or asset management company)</td>
</tr>
<tr>
<td></td>
<td>- Externally-managed subadvised funds</td>
<td>- Institutional market: Employer-sponsored retirement plan</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Investment vehicle</th>
<th>Insurance trusts available through Variable Annuity base contract</th>
<th>Range of investments including:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Securities</td>
<td>Units of subaccounts in insurance trusts and fixed rate options</td>
<td>- Mutual funds</td>
</tr>
<tr>
<td>Investment option restrictions</td>
<td>- Insurer may limit investment options available for use with guaranteed minimum benefit riders to only certain portfolios or asset allocation models</td>
<td>- Separately Managed Account</td>
</tr>
<tr>
<td></td>
<td>- Typically 60-80% maximum equity exposure for use with living benefits</td>
<td>- Assets held in trust at a bank</td>
</tr>
<tr>
<td></td>
<td>- 401(k), 403(b), etc.</td>
<td>- 401(k), 403(b), etc.</td>
</tr>
<tr>
<td>Character of assets</td>
<td>Established / restricted (if GLWB elected) according to insurer risk tolerance, typically:</td>
<td>Established / restricted (for use with CDA) according to insurer risk tolerance, typically:</td>
</tr>
<tr>
<td></td>
<td>- Broadly diversified</td>
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</tr>
<tr>
<td></td>
<td>- Closely track “hedgeable” indices (S&amp;P, NASDAQ, Barclay's, etc.)</td>
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</tbody>
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Reserve Calculation

AG 43 requires the determination of both a Stochastic Reserve and a Standard Scenario Amount, each of which is described below.

Stochastic Reserve

- Starting Assets equal the Working Reserve
- Subsequent surplus amounts are determined by projecting all future revenues, expenses, benefit payments, Working Reserves, and investment earnings at each year-end within each scenario, under prudent estimate assumptions
- The Greatest Present Value of Accumulated Deficiency (GPVAD) within each scenario is equal to the greatest negative discounted surplus amount
- Scenario Reserves are calculated (equal to Starting Assets plus GPVAD) for all scenarios and ranked
- The average of the worst 30% of ranked Scenario Reserves (CTE70) equals the Stochastic Reserve

For VAs, Working Reserves equal the cash surrender value. Revenues include product fees (M&E, rider fees, annual maintenance fees), revenue sharing, and surrender charges. Benefit payments include both death benefits and living benefits. Expenses include maintenance expenses and any applicable trail commissions. Investment earnings include earnings on all assets as applicable.

For CDAs, a possible way of determining reserves is to have cash surrender values, and thus Working Reserves, equal zero. Revenues include the CDA product fee and any other fees which may be associated with the CDA contract, such as maintenance fees or cancellation fees. Benefit payments would include living benefit payments only, as death benefits are not provided by CDAs (as currently designed). Expenses associated with the product would be reflected as appropriate. Investment earnings would apply to surplus, and no investment earnings on customer-owned funds would be realized by the insurance company.

Standard Scenario Reserve

The Standard Scenario amount is the result of a deterministic projection according to prescribed assumptions including mortality, policyholder behavior, and investment performance. The Standard Scenario allows for only certain revenues to be recognized, as follows:

a) During the Surrender Charge Amortization Period:
   i. 0.20% of Account Value; plus
   ii. Any contractually-guaranteed Net Revenue Sharing Income; plus
   iii. The greater of (0.20% of Account Value, Explicit and optional contract charges for guaranteed living benefits); plus
   iv. The greater of (0.20% of Account Value, Explicit and optional contract charges for guaranteed death benefits

b) After the Surrender Charge Amortization Period:
   i. The amount determined in (a) above; plus
   ii. 50% of the excess, if any, of all contract charges over the sum of the items in (a) above, excluding Net Revenue Sharing Income
Due to its product structure, certain items in the Standard Scenario calculation are generally not applicable for a CDA. These include the Account Value charges of 0.20% and the Net Revenue Sharing items listed above. Thus, the Standard Scenario Amount for CDAs is determined by the excess of the CDA product charge(s) over benefit payments, modeled according to the assumptions prescribed by the guidance.

The AG 43 reserve for a contract is equal to the greater of the Stochastic Reserve and the Standard Scenario Amount. In comparing CDAs and VA GLWBs with respect to the reserve guidance, the level and pattern of reserves will be very dependent on the product design. It may be true that, all else equal, a CDA would require a higher reserve than an identical GLWB available with a variable annuity that contains base contract fees and relatively low trail commissions/expenses. However, it is unlikely that the CDA and a VA GLWB would truly be identical in design and modeling assumptions. A comparison of identical GLWBs where the only difference is the presence of a base contract would not be a meaningful comparison, as other product design adaptations would be required to account for the lack of a typical base contract. For example there already exist in the market numerous VA GLWBs that contain very low or no base contract fees. In these VA products, the GLWB guarantee tends to be lower relative to the typical adviser sold VA to compensate for the lack of base contract fees.

The design and pricing considerations which drive similarities and differences between CDAs and GLWBs are discussed below. Due to multiple “moving parts” in terms of design differences between CDAs and GLWBs, it cannot be said that in all cases the AG 43 reserve for CDAs would be unequivocally higher or lower than those of VA GLWBs.

**Hypothetical Reserve Examples**

This section provides illustrative examples of AG 43 reserves for a VA GLWB and CDA. As with any new product, the actual level and pattern of AG43 reserves will be highly dependent on the product design and assumptions. One cannot make any generalizations or conclusions about the relative difference in level or pattern of a VA GLWB versus a CDA that have different product designs or assumptions.

**Product Design**

The examples are based on hypothetical product designs as shown in the table below. Note that these hypothetical designs do not represent actual products offered by any company.

<table>
<thead>
<tr>
<th>Contract Features and Benefits</th>
<th>Hypothetical VA GLWB</th>
<th>Hypothetical CDA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mortality &amp; Expense Risk Charge (M&amp;E)</td>
<td>1.30% of Account Value</td>
<td>N/A</td>
</tr>
<tr>
<td>Contingent Deferred Sales Charge (CDSC)</td>
<td>7-year Surrender Charge Schedule: 7%, 7, 6, 6, 5, 5, 5</td>
<td>N/A</td>
</tr>
<tr>
<td>Death Benefit</td>
<td>Return-of-Premium</td>
<td>N/A</td>
</tr>
<tr>
<td>GLWB Annual Income Rate (Percentage of Benefit Base)</td>
<td>5%</td>
<td>5%</td>
</tr>
<tr>
<td>Embedded Investment Risk</td>
<td>Automatic</td>
<td>Automatic</td>
</tr>
</tbody>
</table>
**Assumptions**

The projections assume an issue age of 60 and a 5 year deferral period before withdrawals begin. Withdrawals are assumed to occur every year thereafter. The initial covered asset amount is $100,000.

Mortality, benefit utilization, and dynamic lapse (where included) assumptions are identical between the VA GLWB and CDA. Different values were used for certain assumptions as warranted by product design or distribution differences. A key difference exists in the base lapse rates assumed for the products. VA GLWB lapse rates reflect the impact of the base contract surrender charge, with low rates during the surrender charge period, a shock lapse rate in the year following the surrender period, and moving to a level ultimate rate thereafter. The base lapse rate pattern assumed for the CDA reflects the product’s lack of surrender charge, starting at a slightly higher level than the VA GLWB, and grading to a slightly lower ultimate rate.

Assumptions associated with the underlying assets and distributor compensation / fees are shown below.

<table>
<thead>
<tr>
<th></th>
<th>VA GLWB</th>
<th>CDA</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Asset Mix of Covered Funds</strong></td>
<td>60% Equity / 40% Bond</td>
<td>60% Equity / 40% Bond</td>
</tr>
<tr>
<td><strong>Fund Expenses</strong></td>
<td>1.00%</td>
<td>1.00%</td>
</tr>
<tr>
<td><strong>Net Revenue Sharing Income</strong></td>
<td>Varies by fund</td>
<td>N/A</td>
</tr>
<tr>
<td><strong>Commissions</strong></td>
<td>Up-front &amp; trail compensation paid by insurance company to producer</td>
<td>N/A</td>
</tr>
<tr>
<td><strong>Investment Advisory Fee</strong></td>
<td>N/A</td>
<td>1.00% annually, paid to investment advisor out of client’s covered funds</td>
</tr>
</tbody>
</table>

**Methodology**

Both products were projected for a 30-year period using the same stochastic economic scenarios. The scenarios were produced using the American Academy of Actuaries (AAA) RBC C-3 Phase I and Phase II generators for interest rates and equity returns, respectively. For each product, the estimated AG 43 reserve requirement was calculated at each annual timestep within each pricing scenario. The estimated reserve is equal to the greater of:

- the CTE 70 of GPVADs resulting from a nested stochastic calculation, and
- Approximation for the Standard Scenario Amount
The exhibits reflect the estimated AG 43 reserves based on stochastic capital market scenarios used for pricing (pricing scenarios are also produced using AAA RBC C-3 Phase I and Phase II generators for interest rates and equity returns, respectively). The values shown are calculated using pricing models and thus include some simplifications as compared to actual valuation models and assumptions. Despite simplifications, the pricing model with which the reserves were projected has the capability to perform the stochastic calculations reflective of the applicable guidance. Thus the reserve shown at each year-end does provide a reasonable approximation of the reserve requirement for the given product design, assumptions, and capital market conditions modeled. Note that the examples illustrate the estimated AG 43 reserve only. In cases where assets are exhausted while policyholder is living, the insurance company will begin making guarantee payments which will continue for as long as the policyholder lives. At that point the AG 43 reserve would be released and a Single Premium Immediate Annuity (SPIA) reserve would be established to fund the life annuity payments. The SPIA reserve is not explicitly illustrated in the examples.

Reserves for the hypothetical VA GLWB and CDA are illustrated in two ways:

1. Reserve patterns for specific economic scenario paths selected from the stochastic pricing scenario set, reflecting decrements due to policyholder mortality only (lapses not assumed to allow for more clear demonstration of account value and reserve progression)
2. Average aggregate reserves for a cohort, reflecting decrements due to both mortality and lapse, based on 200 stochastic economic pricing scenarios

1. Scenario-specific reserve patterns
   a) The two graphs below illustrate a VA GLWB and CDA for the same stochastic economic scenario selected from the stochastic pricing scenario set. In this scenario, covered assets sustain income withdrawals over the 30 year projection. Strong positive market performance in early years allows for the locking in of gains for determining income. This is followed by a period of market volatility. In later years, assets decline due to market performance and policyholder withdrawals, but in this scenario assets are not exhausted during the projection period. The AG 43 remains at a relatively low level, reflective of the low risk associated with the policyholder outliving their assets in this scenario. The levels and patterns of account values, reserves, and income are generally similar between the hypothetical VA GLWB and CDA. In this example, the hypothetical CDA product’s reserves are slightly higher and more volatile due to the product design differences described above.
b) The two graphs below illustrate a hypothetical VA GLWB and CDA for the same stochastic economic scenario selected from the stochastic pricing scenario set. In this example, account values are exhausted due to market performance and policyholder withdrawals. Reserves climb steadily as assets are depleted. Once the client’s assets are exhausted, guarantee payments are made by the insurance company. At this point the AG 43 reserve would be released and SPIA reserve would be established to fund life annuity payments from the insurance company’s
General Account. The levels and patterns of account values, reserves, and income are similar between the hypothetical VA GLWB and CDA. Due to the product design differences described above, there is a slight difference in when assets are exhausted (year 21 for the VA GLWB, year 19 for the CDA). In these cases the illustrative CDA reserves are slightly higher and a little more volatile than illustrative VA GLWB reserves. These effects can be attributed to the hypothetical design.
2. Aggregate reserves

The graph below illustrates the average of scenario-specific reserves at each timestep, based on 200 stochastic equity and interest rate scenarios used for pricing. Reserves exhibit an increasing pattern in early years due to risk associated with the living benefit guarantee. On this aggregate cohort basis, reserves reflect the impact of decrements due to mortality and lapse and thus exhibit a declining pattern in later years.

On average, the aggregate AG 43 reserve for the hypothetical CDA is higher than that of the hypothetical VA GLWB in early years. This is driven by the following assumptions in the hypothetical example and one cannot make a generalization about the differences between CDAs and VA GLWBs:

- Lower revenue in this hypothetical CDA design due to differences in fee structure
- Lack of net revenue sharing income in this hypothetical CDA design.
- Account value depletion due to investment advisory fee deduction from CDA covered assets (increases claims, all else equal)

Note that these drivers are specific to the assumptions and product design used in this example and may not be applicable to all CDAs.

Over time, policyholder withdrawals deplete covered assets. Once assets are exhausted, guarantee payments from the insurance company begin and continue for the life of the policyholder. Thus, policyholder longevity becomes an increasingly significant driver of the risk associated with the products over time. As longevity is assumed to be identical between the two products, the average reserve levels become more similar between the two products in later years, though differences exist due to differences in the product designs illustrated.

The exhibits show that AG43 reserve patterns are similar between GLWBs and CDAs and that AG43 is neither inherently more nor less conservative for CDAs than for VA GLWBs. Reserve levels reflect product design features that impact the overall risk profiles of the
products. Accordingly, AG43 provides an appropriate reserve standard to use for statutory reporting purposes for CDAs.