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| **Dates:** Received | Reviewed by Staff | Distributed | Considered |
| 4/30/2021 | RM |  |  |
| **Notes:** APF 2021-07 |

**Life Actuarial (A) Task Force/ Health Actuarial (B) Task Force**

**Amendment Proposal Form\***

1. Identify yourself, your affiliation and a very brief description (title) of the issue.

 **Identification:** David Neve, VP and Consulting Actuary, Actuarial Resources Corporation of GA

 **Title of the Issue:** Clarify ULSG NPR calculation requirements

2. Identify the document, including the date if the document is “released for comment,” and the location in the document where the amendment is proposed:

 January 1, 2021 NAIC *Valuation Manual ,* but incorporating APF 2020-03

Section 2.A.3 Section 3.B.1, 2, 5 and 6 Section 6.B.5.b

Section 3.A Section 3.C.2 and 3

3. Show what changes are needed by providing a red-line version of the original verbiage with deletions and identify the verbiage to be deleted, inserted or changed by providing a red-line (turn on “track changes” in Word®) version of the verbiage. (You may do this through an attachment.)

 See attached.

As a general overview, Section 3.B.5 stayed in 3.B.5 but was renumbered, but Section 3.B.6 was moved to 3.B.5.b and c.

Below is a detailed summary of the items that were moved to a new section (and/or renumbered) but were not redlined. In some cases, the wording was redlined after it was moved (if the wording changed).

Prior version New version

3.B.5 last half of first sentence 3.B.5.a

3.B.5 2nd and 3rd sentence 3.B.5.d

3.B.5.a thru g renumbered as 3.B.5.d.i thru vii

3.B.6.a 3.B.5.b

3.B.6.b 3.B.5.c

3.B.6.c 3.B.5.c.i (with sub-bullets renumbered)

3.B.6.d 3.B.5.c.ii (with sub-bullets renumbered)

3.B.6.e 3.B.5.c.iii (with sub-bullets renumbered)

4. State the reason for the proposed amendment? (You may do this through an attachment.)

The NPR calculation requirements for ULSG products are currently contained in Section 3.B.5 and 3.B.6 of the Valuation Manual.   The current wording takes the reader back and forth between Section 3.B.5 and 3.B.6 when trying to follow the reserve calculation for ULSG products, which can be confusing. And the current wording also has led some people to incorrectly interpret Section 3.B.5 to be applicable to UL products without a SG.

The APF combines the current 3.B.5 and 3.B.6. sections into a single section labeled 3.B.5 and clarifies how to determine the NPR when the policy duration at the valuation date is either prior to, or after the SG has expired.   Importantly, no change has been made to the current requirements, only the formatting of the requirements to make them easier to follow. Note that the new wording has flipped the order of the old 3.B.5 and 3.B.6 when combining them in the new 3.B.5, but this movement is not shown as a tracked change (since no changes were made to the existing reserve calculation requirements in the two sections).

Section 3.A has also been revised to eliminate the confusion that can arise on whether the NPR for products in the All Other VM-20 Reserving Category is still a VM-20 reserve. The NPR requirement for products in the All Other VM-20 Reserving Category has been moved to Section 3.B.6.

Impacted references have been updated.

**ATTACHMENT**

**Section 2: Minimum Reserve**

1. All policies subject to these requirements shall be included in one of the VM-20 Reserving Categories, as specified in Section 2.A.1, Section 2.A.2 and Section 2.A.3 below.
2. Term Reserving Category —
3. ULSG Reserving Category —
	1. All Other VM-20 Reserving Category– All policies and riders belonging to the All Other VM-20 Reserving Category are to be included in Section 2.A.3.c unless the company has elected to exclude a group of them from the stochastic reserve calculation or both the deterministic and stochastic reserve calculations and has applied the applicable exclusion test defined in Section 6, passed the test and documented the results.

### Section 3: Net Premium Reserve

1. Applicability
	1. The NPR for each policy must be determined on a seriatim basis pursuant to Section 3.
	2. When valuing term riders pursuant to Paragraph E in “Riders and Supplemental Benefits Requirements” in Section II, the reserve requirements for term policies are applicable.

B. NPR Calculation

1. For the purposes of Section 3, the following terms apply:
2. The “level secondary guarantee” at any time is:

i. For a shadow account secondary guarantee, the shadow account fund value that would have existed at that time assuming payment of the level gross premium determined according to Section 3.B.5.c.i.1.

ii. For a cumulative premium secondary guarantee, the amount of cumulative level gross premiums determined according to Section 3.B.5.c.i.1, accumulated with any interest or accumulation factors per the contract provisions for the secondary guarantee.

1. Section 3.B.4 and Section 3.B.5 provide the calculation of a terminal NPR under the assumption of an annual mode gross premium. In Section 3.B.4 and Section 3.B.5, the gross premium referenced is the gross premium for the policy assuming an annual premium mode.
	1. For all policies and riders within the Term Reserving Category, other than those addressed in Section 3.B.8 below, the NPR on any valuation date shall be equal to the actuarial present value of future benefits less the actuarial present value of future annual valuation net premiums as follows:

5. For all policies and riders within the ULSG Reserving Category, the NPR shall be determined as follows:

* + 1. If the policy duration on the valuation date is Prior to the point when all secondary guarantee periods have expired, the NPR shall, be the greater of the reserve amount determined in Section 3.B.5.c and the reserve amount determined in Section 3.B.5.d, subject to the floors specified in Section 3.D.2.
		2. If the policy duration on the valuation date is after the expiration of all secondary guarantee periods, the NPR shall be the reserve amount determined according to Section 3.B.5.d only, subject to the floors specified in 3.D.2.
		3. A reserve amount for the policy shall be calculated assuming the secondary guarantee is in effect as described below. If the policy has multiple secondary guarantees, the NPR shall be calculated as below for the secondary guarantee that provides the greatest NPR as of the valuation date. For the purposes of this subsection, let n be the longest number of years the policy can remain in force under the provisions of the secondary guarantee. However, if a shorter period produces a materially greater NPR, then n shall be that shorter number of years.
	1. As of the policy issue date:
		+ 1. Determine the level gross premium at issue, assuming payments are made each year for which premiums are permitted to be paid, such period defined as v years in this subsection, that would keep the policy in force to the end of year n, based on policy provisions, including the secondary guarantee provisions, such as mortality, interest and expenses. In no event shall v be greater than n for purposes of the NPR calculated in this subsection.
1. Using the level gross premium from Section 3.B.5.c.i above, determine the value of the expense allowance components for the policy at issue as $x\_{1}$,$ y\_{2-5}$ and $z\_{1}$ defined below.

$x\_{1}$= a first-year expense equal to the level gross premium at issue

$y\_{2-5}$= an expense equal to 10% of the level gross premium and applied in each year from the second through fifth policy year

$z\_{1}$= a first-year expense of $2.50 per $1,000 of insurance issued

The expense allowance shall be amortized over the span of years in the secondary guarantee period during which premiums are permitted to be paid. *Ex+t*$, $the expense allowance$ $ balance as of the end of the policy year t, shall be computed as follows:

$E\_{x+t}= VNPR⦁\ddot{a}\_{x+t:\overline{v-t|}}$ $\left[\frac{x\_{1}+z\_{1}}{\ddot{a}\_{x:\overbar{v|}}}+ y\_{2-5} ⦁ C\_{x+t}\right] $ for t < v

= 0 for t ≥ v

Where:

t = 1,2,.. (number of completed years since issue)

*VNPR = Valuation Net Premium Ratio from 3.B.5.c.i.3*

$C\_{x+t}$ = 0 when t = 1

=$\sum\_{w=1}^{t-1}(1/\ddot{a}\_{x+w:\overbar{v-w|}} )$ when 2≤ t ≤5

$ =C\_{x+5}$ when t>5

1. Determine the annual valuation net premiums at issue as that uniform percentage (the valuation net premium ratio) of the respective gross premiums such that at issue the actuarial present value of future valuation net premiums over the n-year period shall equal the actuarial present value of future benefits over the n-year period. The valuation net premium ratio determined shall not change for the policy.
	* 1. After the policy issue date, on each future valuation date, the NPR shall be determined as follows:

As of the valuation date for the policy being valued, determine the actual secondary guarantee, denoted ASGx+t, as outlined in Section 3.B.1.c and the fully funded secondary guarantee, denoted FFSGx+t, as outlined in Section 3.B.1.b.

1. Divide ASGx+t by FFSGx+t, with the resulting ratio capped at 1. The ratio is intended to measure the level of prefunding for a secondary guarantee, which is used to establish reserves. Assumptions within the numerator and denominator of the ratio, therefore, must be consistent in order to appropriately reflect the level of prefunding. As used here, “assumptions” include any factor or value, whether assumed or known, which is used to calculate the numerator or denominator of the ratio.
2. Compute the net single premium (NSPx+t) on the valuation date for the coverage provided by the secondary guarantee for the period of time ending at attained age x+n, using the interest, lapse and mortality assumptions prescribed in Section 3.C below. The net single premium (NSP) shall include consideration for death benefits only.
3. The NPR for an insured age x at issue at time t shall be according to the formula below:

$$Min\left[\frac{ASG\_{x+t}}{FFSG\_{x+t}} , 1\right]⦁ NSP\_{x+t}- E\_{x+t}$$

**Guidance Note:** For a non-integer value of t, $E\_{x+t}$ is obtained by taking the present value at duration t of $E\_{x+T}$, where T is the next higher integer; i.e., entails discounting by valuation interest, mortality, and lapse for the fractional year between the valuation date and next anniversary (T – t).

* + 1. Actuarial present values referenced in this Section 3.B.5.c are calculated using the interest, mortality and lapse assumptions prescribed in Section 3.C below.
		2. A reserve amount for the policy shall be calculated assuming the secondary guarantee is not in effect. The reserve amount shall be determined by the policy features and guarantees of the policy without considering any secondary guarantee provisions as follows:
1. Determine the level gross premium at issue, assuming payments are made each year for which premiums are permitted to be paid, such period defined as “s” in this subsection, that would keep the policy in force for the entire period coverage is to be provided based on the policy guarantees of mortality, interest and expenses.
	* 1. Using the level gross premium from Section 3.B.5.d.i, determine the value of the expense allowance components for the policy at issue as *x1*, *y2-5* and *z1* defined below.

$x\_{1}$*x1* = a first-year expense equal to the level gross premium at issue

*y2-5* = an expense equal to 10% of the level gross premium and applied in each year from the second through fifth policy year

*z1*= a first-year expense of $2.50 per $1,000 of insurance issued

The expense allowance shall be amortized over the period during which premiums are permitted to be paid. *Ex+t*, the expense allowance balance, as of the end of policy year t, shall be calculated as follows:

$E\_{x+t}$= 𝑉𝑁𝑃𝑅 ⦁ $\ddot{a}\_{x+t:\left.\overbar{s-t}\right|}\left[{\left(x\_{1}+z\_{1}\right)}/{\ddot{a}\_{x:\overbar{\left.s\right|}}}+y\_{2-5}⦁C\_{x+t }\right]\_{}$ for t < s

 = 0 for t ≥ s

Where:

 t = 1,2,.. (number of completed years since issue)

$$VNPR=Valuation Net Premium Ratio from 3.B.5.c$$

$C\_{x+t }$= 0 when t = 1

 = $\sum\_{w=1}^{t-1}({1}/{\ddot{a}\_{x+w:\left.\overbar{s-w}\right|}})$ when 2 ≤ t ≤ 5

 =$ C\_{x+5}$ when t > 5

* + 1. Determine the annual valuation net premiums as that uniform percentage (the valuation net premium ratio) of the respective gross premiums, such that at issue the actuarial present value of future valuation net premiums shall equal the actuarial present value of future benefits.
		2. For a policy issued at age *x,* at any duration *t*, the net premium reserve shall equal:

$m\_{x+t }⦁ r\_{x+t}$ Where:

* + - 1. $m\_{x+t}$ = the actuarial present value of future benefits less the actuarial present value of future valuation net premiums and less the unamortized expense allowance for the policy,$E\_{x+t}$ ,

**Guidance Note:** For a non-integer value of t, $E\_{x+t}$ is obtained by taking the present value at duration t of $E\_{x+T}$, where T is the next higher integer; i.e., entails discounting by valuation interest and survivorship for the fractional year between the valuation date and the next anniversary (T – t).

Let:

 *ex + t* = max (the actual policy fund value on the valuation date, 0)

*fx + t* = the policy fund value on the valuation date is that amount which, together with the payment of the future level gross premiums determined in Section 3.B.5.d.i above, keeps the policy in force for the entire period coverage is to be provided, based on the policy guarantees of mortality, interest and expenses.

Then set rx+t equal to:

     1, if 𝑓𝑥+t  < 0

      min([𝑒𝑥+t / 𝑓𝑥+t], 1), otherwise

* + 1. The future benefits used in determining the value of *mx+t* shall be based on the greater of *ex+t*and *fx+t* together with the future payment of the level gross premiums determined in Section 3.B.5.d.i above, and assuming the policy guarantees of mortality, interest and expenses.
		2. The values of *ä* are determined using the NPR interest, mortality and lapse assumptions applicable on the valuation date.
		3. Actuarial present values referenced in this Section 3.B.5.d are calculated using the interest, mortality and lapse assumptions prescribed in Section 3.C.
	1. For all policies and riders within the All Other VM-20 Reserving Category, the NPR shall be determined pursuant to applicable methods in VM-A and VM-C for the basic reserve. The mortality tables to be used are those defined in Section 3.C.1 and in VM-M Section 1.H.
	2. The actuarial present value of future benefits equals the present value of future benefits including, but not limited to, death, endowment (including endowments intermediate to the term of coverage) and cash surrender benefits. Future benefits are before reinsurance and before netting the repayment of any policy loans.
	3. For life insurance coverage that the company has assumed on a YRT basis, the reinsurer’s net premium reserve shall be one half year’s cost of insurance for the reinsured net amount at risk.
1. Net Premium Reserve Assumptions

2. Interest Rates

b. For NPR amounts calculated according to Section 3.B.4 or Section 3.B.5:

3. Lapse Rates

c. For NPR amounts calculated according to Section 3.B.5, the lapse rate, Lx+t, for an insured age *x* at issue for all durations subsequent to the valuation date shall be determined as follows:

Determine the ratio $R\_{x+t}$ where:

$R\_{x+t}= \left[FFSG\_{x+t}- ASG\_{x+t}\right]/ \left[FFSG\_{x+t}- LSG\_{x+t}\right]$ but not > 1 and not <0

Where:

*FFSGx+t*= the fully funded secondary guarantee on the valuation date for the insured age *x* at issue

*ASGx+t*= the actual secondary guarantee on the valuation date for the insured age *x* at issue

*LSGx+t*= the level secondary guarantee on the valuation date for the insured age *x* at issue

**Guidance Note:** The *FFSGx+t*, *ASGx+t*, and *LSGx+t* are based on the secondary guarantee values as of the valuation date and will remain constant throughout the cash flow projection. This will result in a constant lapse assumption, calculated as of the valuation date, that does not vary by duration throughout the cash flow projection for the NPR calculation.

ii. As of the valuation date, which is t years after issue, the annual lapse rate for the policy shall be assumed to be level for all future years and denoted as *Lx+t,* which shall be set equal to:

*Lx+t = Rx+t •* 0.01 + (1 – *Rx+t* ) • 0.005• *rx+t*

Where *rx+t* is the ratio determined in Section 3.B.5.d.iv.2.

**Guidance Note:** By similar logic, it follows (from ASGx+t being 0 when t=0) that the level annual lapse rate to be used in the calculations in Section 3.B.5.c.i.2 and 3.B.5.c.i.3 is 1%. On the other hand, when performing the calculations in Section 3.B.5.c.ii.3, *Lx+t,*though level, is not generally equal to what it was for the same policy on the previous valuation date.

**Section 6: Stochastic and Deterministic Exclusion Tests**

1. Deterministic Exclusion Test (DET)

5. For purposes of determining the valuation net premiums used in the demonstration in Section 6.B.2:

a. If pursuant to Section 2, the NPR for the group of policies is the minimum reserve required under VM-A and VM-C, then the valuation net premiums are determined according to those minimum reserve requirements.

b. If the NPR is determined according to Section 3.B.4 or Section 3.B.5, then the lapse rates assumed for all durations shall for the purposes of the DET be set to 0%;