

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.

Mary Bahna-Nolan, Joint American Academy of Actuaries Life Experience Committee and Society of Actuaries Preferred Mortality Oversight Group – adoption of new CSO tables

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:

Valuation Manual (June 18, 2015), VM-20 Sections 3.C.1.c.(4) (page 11)

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 pages – note page 11

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

Remove the provisions for unisex rates as they would apply to reserves. Unisex rates have been authorized for nonforfeiture under certain conditions, but have not been prescribed for reserves. This provision was included in error, and should be removed.

* This form is not intended for minor corrections, such as formatting, grammar, cross-references or spelling. Those types of changes do not require action by the entire group and may be submitted via letter or email to the NAIC staff support person for the NAIC group where the document originated.

NAIC Staff Comments:

Dates: Received	Reviewed by Staff	Distributed	Considered
Notes:			

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VM-20: REQUIREMENTS FOR PRINCIPLE-BASED RESERVES FOR LIFE PRODUCTS

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Section 1.	Purpose and Definitions

- A. These requirements establish the minimum reserve valuation standard for individual life insurance policies issued on or after the operative date of the Valuation Manual and subject to a PBR valuation with a net premium reserve floor under the Standard Valuation Law.

B. These requirements constitute the Commissioner's Reserve Valuation Method (CRVM) for policies of individual life insurance.

C. Definitions

1. The term "anticipated experience assumption" means an expectation of future experience for a risk factor given available, relevant information pertaining to the assumption being estimated.
2. The term "clearly defined hedging strategy" means a strategy undertaken by a company to manage risks that meet the criteria specified in the applicable requirement.
3. The term "deterministic reserve" means a reserve amount calculated under a defined scenario and a single set of assumptions.
4. The term "industry basic table" means an NAIC-approved industry experience mortality table (without the valuation margin).
5. The term "gross reserve" means the minimum reserve held in the absence of any ceded reinsurance.
6. The term "margin" means an amount included in the assumptions, except when the assumptions are prescribed, used to determine the modeled reserve that incorporates conservatism in the calculated value consistent with the requirements of the various sections of the Valuation Manual. It is intended to provide for estimation error and adverse deviation.
7. The term "model segment" means a group of policies and associated assets that are modeled together to determine the path of net asset earned rates.
8. The term "modeling efficiency technique" shall refer to any technique designed to reduce the complexity or run time of an actuarial model without compromising the accuracy of the results calculated by the model.

Guidance Note: Examples include, but are not limited to:

1. Choosing a reduced set of scenarios from a larger set or an alternative set consistent with prescribed models and parameters.
2. Generating a smaller liability or asset model to represent the full seriatim model using grouping compression techniques, or other similar simplifications.
9. The term "mortality segment" means a subset of policies for which a separate mortality table representing the prudent estimate assumption will be determined.
10. The term "net asset earned rates" means the path of earned rates reflecting the net general account portfolio rate in each projection interval (net of appropriate default costs and investment expenses).
11. The term "net premium reserve" means the amount determined in Section 3.
12. The term "non-guaranteed element" or "NGE" means either: (a) dividends under participating policies or contracts; or (b) other elements affecting life insurance or annuity policyholder/contract holder costs or values that are both established and subject to change at the discretion of the insurer.
13. The term "policy" means an individual life insurance policy included in the scope of these requirements.
14. The term "policyholder efficiency" means the phenomenon that policyholders will act in their best interest with regard to the value of their policy. A policyholder acting with high policyholder efficiency would take actions permitted in their contract which would provide the greatest relative value. Such actions include but are not limited to not lapsing a low value or no value contract, persisting, surrendering, applying additional premium, and exercising loan and partial surrender provisions.

15. The term “pretax interest maintenance reserve” or “PIMR” means the statutory interest maintenance reserve liability adjusted to a pre-tax basis for each model segment at the projection start date and at the end of each projection interval.
16. The term “Principle-Based Reserve Actuarial Report” or “PBR Actuarial Report” means the document containing supporting information prepared by the company as required by VM-31.
17. The term “prudent estimate assumption” means a risk factor assumption developed by applying a margin to the anticipated experience assumption for that risk factor.
18. The term “reinsurance cash flows” means the amount paid under a reinsurance agreement between a ceding company and an assuming company. Positive reinsurance cash flows shall represent amounts payable from the assuming company to the ceding company; negative reinsurance cash flows shall represent amounts payable from the ceding company to the assuming company.
19. The term “reinsurance aggregate cash flows” means the difference between reinsurance cash flows and reinsurance discrete cash flows, as defined below. An example of reinsurance aggregate cash flows includes experience refunds.

Guidance Note: If a reinsurance agreement gives rise to reinsurance aggregate cash flows, the company should take care to examine and apply the guidance in Sections 8.A.3 through 8.A.5 with regard to the treatment of such cash flows.
20. The term “reinsurance discrete cash flows” means reinsurance cash flows determined by applying reinsurance terms to an individual covered policy, without reference to the circumstances and events of other policies. Examples of reinsurance discrete cash flows would be proportional sharing of one or more items of revenue or expense associated with an underlying reinsured policy.
21. The term “scenario” means a projected sequence of events used in the cash flow model, such as future interest rates, equity performance, or mortality.
22. The term “scenario reserve” means the amount determined on an aggregated basis for a given scenario that is used as a step in the calculation of the stochastic reserve.
23. A “secondary guarantee” is a guarantee that a policy will remain in force for some period of time (the secondary guarantee period) even if its fund value is exhausted, subject to one or more conditions.
24. The term “seriatim reserve” means the amount determined for a given policy that is used as a step in the calculation of the deterministic reserve.
25. The term “stochastic reserve” means the amount determined in Section 5.
26. The term “stochastic exclusion test” means a test to determine whether a group of policies is required to comply with stochastic modeling requirements.
27. The term “universal life insurance policy” means a life insurance policy where separately identified interest credits (other than in connection with dividend accumulations, premium deposit funds, or other supplementary accounts) and mortality and expense charges are made to the policy. A universal life insurance policy may provide for other credits and charges, such as charges for cost of benefits provided by rider.
28. The term “variable life insurance policy” means a policy that provides for life insurance, the amount or duration of which varies according to the investment experience of any separate account or accounts established and maintained by the insurer as to the policy.

Section 2. Minimum Reserve

- A. All policies subject to these requirements shall be included in one of the groups defined by paragraphs 1, 2 or 3. The company may elect to exclude one or more groups of policies from the stochastic reserve calculation and the

deterministic reserve calculation if the exclusion tests determined pursuant to section 6 are passed. The minimum reserve equals the sum of:

1. For the group of policies that pass both the stochastic exclusion and the deterministic exclusion test: the aggregate net premium reserve for those policies.
 2. For the group of policies that pass the stochastic exclusion test but do not pass the deterministic exclusion test: the aggregate net premium reserve plus the excess, if any, of the deterministic reserve determined pursuant to Section 4 over the quantity (A-B) where A = the aggregate net premium reserve for those policies, and B = any due and deferred premium asset held on account of those policies.
 3. For the group of policies that fail the stochastic exclusion test, and for the group of policies not subject to the exclusion tests: the aggregate net premium reserve plus the excess, if any, of the greater of the deterministic reserve determined pursuant to Section 4 and the stochastic reserve determined pursuant to Section 5 over the quantity (A-B) where A = the aggregate net premium reserve for those policies, and B = any due and deferred premium asset held on account of those policies.
- B. For purposes of this Section, the aggregate net premium reserve for a group of policies is the sum of the net premium reserve pursuant to Section 3 for each of the policies of the group less any net premium reserve credit for reinsurance ceded pursuant to Section 8.B. for the same group of policies.
- C. The minimum reserve for each policy is equal to the net premium reserve for that policy calculated as specified in Section 3 less that policy's portion of any net premium reserve credit for reinsurance ceded as specified in Section 8.B. (the Allocation Net Premium Reserve) plus the policy's allocated portion of any reserve excess defined as: .

For each policy of the group whose reserve is determined according to A.2., that policy's allocated portion of any reserve excess is the Allocation Net Premium Reserve for that policy multiplied by the ratio of the deterministic reserve excess determined by A.2. divided by the aggregate Allocation Net Premium Reserves for that group of policies.

For each policy of the group whose reserve is determined according to A.3., that policy's allocated portion of any reserve excess is the Allocation Net Premium Reserve for that policy multiplied by the ratio of the reserve excess determined by A.3. divided by the aggregate Allocation Net Premium Reserves for that group of policies.

- D. If the company elects to perform the stochastic and deterministic exclusion tests in Section 6 pursuant to section 2.B above, then:
1. Stochastic reserves must be calculated for each group of policies that fail the stochastic exclusion test in Section 6.
 2. Deterministic reserves must be calculated for each group of policies that fail either the deterministic exclusion or stochastic exclusion tests in Section 6.
 3. If a company elects to calculate stochastic reserves for one or more groups of policies, the company is not required to perform the exclusion tests in Section 6 for those policies.
 4. A group of policies for which neither deterministic nor stochastic reserves are required or calculated are not principle-based valuation reserves as defined under the Standard Valuation Law.
- E. The company may calculate the deterministic reserve and the stochastic reserve as of a date no earlier than three months before the valuation date, using relevant company data, provided an appropriate method is used to adjust those reserves to the valuation date. Company data used for experience studies to determine prudent estimate assumptions are not subject to this three-month limitation.
- F. If a company has separate account business, the company shall allocate the minimum reserve between the general and separate accounts subject to the following:
1. The amount allocated to the general account shall not be less than zero and shall include any liability related to contractual guarantees provided by the general account; and

2. The amount allocated to the separate account shall not be less than the sum of the cash surrender values and not be greater than the sum of the account values attributable to the separate account portion of all such contracts.

- G. A company may use simplifications, approximations and modeling efficiency techniques to calculate the net premium reserve, the deterministic reserve and/or the stochastic reserve required by this section if the company can demonstrate that the use of such techniques does not understate the reserve by a material amount and the expected value of the reserve calculated using simplifications, approximations and modeling efficiency techniques is not less than the expected value of the reserve calculated that does not use them.

In such case, information shall be available to ensure that a deterministic reserve amount calculated as the total of the seriatim (policy-by-policy, with respect to liability cash flows) reserve calculations produces a reserve not materially different than the deterministic reserve amount calculated using groupings of policies. This does not preclude use of model segmentation for purposes of determining discount rates. VM-31 Section 3.E.3. provides details.

- H. The reserves for supplemental benefits and riders shall be calculated consistent with the requirements for “Riders and Supplemental Benefits” in VM-00, Section II.

Section 3. Net Premium Reserve

A. Applicability

1. The net premium reserve for each term policy, universal life insurance with secondary guarantee policy (definitions of products to be included need to be determined) must be determined pursuant to Section 3.
2. Except for policies subject to Section 3.A.1, the net premium reserve 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.

B. For purposes of this Section 3 and Section 6, the following definitions apply:

1. The “fully funded secondary guarantee” at any time is:
 - a. For a shadow account secondary guarantee, the minimum shadow account fund value necessary to fully fund the secondary guarantee for the policy at that time.
 - b. For a cumulative premium secondary guarantee, the amount of cumulative premiums required to have been paid to that time that would result in no future premium requirements to fully fund the guarantee, accumulated with any interest or accumulation factors per the contract provisions for the secondary guarantee.

2. The “actual secondary guarantee” at any time is:
 - a. For a shadow account secondary guarantee, the actual shadow account fund value at that time.
 - b. For a cumulative premium secondary guarantee, the actual premiums paid to that point in time, accumulated with any interest or accumulation factors per the contract provisions for the secondary guarantee.

Drafting Note: This definition as it relates to a cumulative premium product needs a final review.

3. The “level secondary guarantee” at any time is:
 - a. For a shadow account secondary guarantee, the shadow account fund value at that time assuming payment of the level gross premium determined according to Subsection 3.B.6.c.i.

- b. For a cumulative premium secondary guarantee, the amount of cumulative level gross premiums determined according to Section 3.B.6.c.i, accumulated with any interest or accumulation factors per the contract provisions for the secondary guarantee.

Guidance Note: The definition of the net premium reserve in subsections 4, 5 and 6 is intended to result in a terminal net premium reserve under the assumption of an annual mode gross premium. The gross premium referenced should be the gross premium for the policy assuming an annual premium mode. The reported reserve as of any valuation date should reflect the actual premium mode for the policy and the actual valuation date relative to the policy issue date either directly or through adjusting accounting entries.

4. For all policies other than universal life policies, on any valuation date the net premium reserve shall be equal to the actuarial present value of future benefits less the actuarial present value of future annual valuation net premiums as follows:
 - a. The annual valuation net premiums shall be a uniform percent of the respective adjusted gross premiums, described in Section 3.B.4.b, such that at issue the actuarial present value of future valuation net premiums shall equal the actuarial present value of future benefits plus an amount equal to \$2.50 per \$1,000 of insurance for the first policy year only.

For policies subject to the shock lapse provisions of Section 3.C.3.b.iii, valuation net premiums for policy years after the shock lapse shall be limited and may result in two uniform percentages, one applicable to policy years prior to the shock lapse and one applicable to policy years following the shock lapse. For these policies, these percentages shall be determined as follows:

- i. Compute the actuarial present value of benefits for policy years following the shock lapse.
 - ii. Compute the actuarial present value of valuation net premiums for policy years following the shock lapse.
 - iii. If ii/i is greater than 135%, reduce the net valuation premiums in ii uniformly to produce a ratio of ii/i of 135%.
 - iv. If the application of iii produces an adjustment to the net valuation premiums following the shock lapse, increase the net valuation premiums for policy years prior to the shock lapse by a uniform percentage such that at issue the actuarial present value of future valuation net premiums equals the actuarial present value of future benefits plus \$2.50 per \$1,000 of insurance for the first policy year only.
- b. Adjusted gross premiums shall be determined as follows:
 - i. The adjusted gross premium for the first policy year shall be set at zero.
 - ii. The adjusted gross premium for any year from the second through fifth policy year shall be set at 90% of the corresponding gross premium for that policy year.
 - iii. The adjusted gross premium for any year after the fifth policy year shall be set equal to the corresponding gross premium for that policy year.
 - c. The gross premium in any policy year is the maximum guaranteed gross premium for that policy year.
 - d. Actuarial present values are calculated using the interest, mortality, and lapse assumptions prescribed in Section 3.C.
5. For any universal life policy, a reserve shall be determined by the policy features and guarantees of the policy without considering any secondary guarantee provisions. The net premium reserve shall be calculated as follows:
 - a. 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.

- b. Using the level gross premium from Section 3.B.5.a, determine the value of the expense allowance components for the policy at issue as x_1 , y_{2-5} , and z 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, E_{x+t} , shall be amortized as follows over the period for which premiums are permitted to be paid:

$$E_{x+t} = VNPR \cdot \ddot{a}_{x+t:\overline{s-t}|} \left[(x_1 + z_1) / \ddot{a}_{x:\overline{s}|} + y_{2-5} \cdot C_{x+t} \right] \quad \text{for } t < s$$

$$= 0 \quad \text{for } t \geq s$$

Where:

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

$$C_{x+t} = 0 \quad \text{when } t = 1$$

$$= \sum_{w=1}^{t-1} (1 / \ddot{a}_{x+w:\overline{s-w}|}) \quad \text{when } 2 \leq t \leq 5$$

$$= C_{x+5} \quad \text{when } t > 5$$

- c. 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.
- d. For a policy issued at age x , on any valuation date t , the net premium reserve shall equal:

$$m_{x+t} \cdot r_{x+t} \quad \text{where:}$$

- i. 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} ,

- ii. r_{x+t} = the ratio e_{x+t} / f_{x+t} , but not greater than 1, with (e_{x+t}) and (f_{x+t}) defined as below:

= the actual policy fund value on the valuation date t

f_{x+t} = The policy fund value on the valuation date t is that amount which, together with the payment of the future level gross premiums determined in subsection 3.B.5.a 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.

- e. The future benefits used in determining the value of m shall be based on the policy fund value on the valuation date t together with the future payment of the level gross premiums determined in subsection 3.B.5.a above, and assuming the policy guarantees of mortality, interest and expenses.
- f. The values of \ddot{a} are determined using the net premium reserve interest, mortality and lapse assumptions applicable on the valuation date.

- g. Actuarial present values referenced in this subsection 3.B.5 are calculated using the interest, mortality, and lapse assumptions prescribed in Subsection C of this section.
6. For any universal life policy for which the longest secondary guarantee period is more than five years, or if less than five years, specified premium for the secondary guarantee period is less than the net level reserve premium for the secondary guarantee period based on the CSO valuation tables as defined in VM-20 Section 3.C and VM-M, or the applicable valuation interest rate; and the initial surrender charge is less than 100% of the first year annualized specified premium for the secondary guarantee period, during the secondary guarantee period the net premium reserve shall be the greater of the reserve amount determined according to subsection 3.B.5, assuming the policy has no secondary guarantees, and the reserve amount for the policy determined according to the methodology and requirements subsections 3.B.6.b through 3.B.6.e below.
- a. After the expiration of the secondary guarantee period, the net premium reserve shall be the net premium reserve determined according to subsection 3.B.5 only.
- b. If the policy has multiple secondary guarantees, the net premium reserve shall be calculated as below for the secondary guarantee that provides the longest period for which the policy can remain in force under the provisions of the secondary guarantee, such period defined as “n” in this Subsection. The resulting net premium reserve shall be used in the comparison with the net premium reserve calculated in accordance with Subsection 3.B.5.
- c. As of the policy issue date:
- i. 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” in this Subsection that would keep the policy in force to the end of the secondary guarantee period, based on the secondary guarantee assumptions as to mortality, interest and expenses. In no event shall “v” be greater than “n” for purposes of the net premium reserve calculated in this Subsection.
- ii. Using the level gross premium from subsection 3.B.6.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, E_{x-t} , shall be amortized as follows over the period for which premium are permitted to be paid:

$$E_{x+t} = VNPR * \ddot{a}_{x+t:\overline{v-t}|} [(x_1 + z_1)/\ddot{a}_{x:\overline{v}|} + y_{2-5} \cdot C_{x+t}] \quad \text{for } t < v$$

$$= 0 \quad \text{for } t \geq v$$

Where:

$VNPR$ = Valuation Net Premium Ratio from 3.B.6.c.iii

$$C_{x+t} = 0 \quad \text{when } t = 1$$

$$= \sum_{w=1}^{t-1} (1/\ddot{a}_{x+w:\overline{v-w}|}) \quad \text{when } 2 \leq t \leq 5$$

$$= C_{x+5} \quad \text{when } t > 5$$

- iii. 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 and over the secondary guarantee period the actuarial present value of future valuation net premiums shall equal the actuarial present value of future benefits. The valuation net premium ratio determined shall not change for the policy.
- d. After the policy issue date, on each future valuation date, t , the net premium reserve shall be determined as follows:
 - i. Determination should be made of the amount of actual shadow account as of the valuation date, ASG_{x+t} , as defined in 3.B.2.
 - ii. As of the valuation date for the policy being valued, for policies utilizing shadow accounts, determine the minimum amount of shadow account required to fully fund the guarantee, $FFSG_{x+t}$, as defined in 3.B.1. For any policy for which the secondary guarantee cannot be fully funded in advance, solve for the minimum sum of any possible excess funding (either the amount in the shadow account or excess cumulative premium payments depending on the product design) and the present value of future premiums (using the maximum allowable valuation interest rate and the minimum mortality standards allowable for calculating basic reserves) that would fully fund the guarantee. The result from i above should be divided by this number, with the resulting ratio capped at 1.00. 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.
 - iii. Compute the net single premium (NSP_{x+t}) on the valuation date for the coverage provided by the secondary guarantee for the remainder of the secondary guarantee period, using the interest, lapse and mortality assumptions prescribed in Subsection C of this section. The net single premium shall include consideration for death benefits only.
 - iv. The net premium reserve for an insured age x at issue at time t shall be according to the formula below:

$$\text{Min} \left[\frac{ASG_{x+t}}{FFSG_{x+t}}, 1 \right] \cdot NSP_{x+t} - E_{x+t}$$

- e. Actuarial present values referenced in this subsection B.6 are calculated using the interest, mortality and lapse assumptions prescribed in Subsection C of this section.
- 7. 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.

C. Net Premium Reserve Assumptions

1. Mortality Rates

- a. Except as indicated in subsection 3.C.1.b, and subject to the conditions outlined for reserves in VMA-814 and A-815 in Appendix A of this manual, the mortality standard used in determining the present values described in Subsection B of this Section shall be the 2001 Commissioners Standard Ordinary (CSO) Mortality Table as defined in VM-M Section 1.G. of this manual.
- b. Subject to the conditions defined in 3.C.1.c., the 2017 Commissioner's Standard Ordinary Mortality Tables as defined in VM-M Section 1.H. is required as the valuation standard for Ordinary Life policies issued on or after January 1, 2020 and subject to this Section {intent is Section 3 of VM-20}. A company may elect to apply this table to determine minimum reserve standards to one or more plans of insurance for policies issued on or after January 1, 2017.
- c. Conditions for application of the 2017 CSO:
 - (1) For each plan of insurance with separate rates for smokers and nonsmokers, an insurer may use:

- (a) Composite mortality tables to determine minimum reserve liabilities; or

(b) Smoker and nonsmoker mortality to determine minimum reserve liabilities if nonforfeiture values are also determined using smoker and nonsmoker mortality.

- (2) For plans of insurance without separate rates for smokers and nonsmokers, the composite mortality tables shall be used.
- (3) For the purpose of determining minimum reserve values and amounts of paid-up nonforfeiture benefits, the 2017 CSO Mortality Table may, at the option of the company for each plan of insurance, be used in its ultimate or select and ultimate form.

~~(4) Gender Blended Tables shall apply in the following circumstances:~~

~~For any ordinary life insurance policy delivered or issued for delivery that utilizes the same premium rates and charges for male and female lives or is issued in circumstances where applicable law does not permit distinctions on the basis of gender, a mortality table that is a blend of the 2017 CSO Mortality Table (M) and the 2017 CSO Mortality Table (F) may, at the option of the company for each plan of insurance, be used in determining minimum reserves.~~

d. At the election of the company, for any one or more specified plans of insurance and subject to satisfying the conditions stated in 3.C.1.e., the 2017 CSO Preferred Class Structure Mortality Table may be substituted in place of the 2017 CSO Smoker or Nonsmoker Mortality Table as the minimum valuation standard for policies issued on or after January 1, 2017.

e. Conditions

(1) For each plan of insurance with separate rates for preferred and standard nonsmoker lives, an insurer may use the super preferred nonsmoker, preferred nonsmoker, and residual standard nonsmoker tables to substitute for the nonsmoker mortality table found in the 2017 CSO Mortality Table to determine minimum reserves. At the time of election and annually thereafter, except for business valued under the residual standard nonsmoker table, the appointed actuary shall certify that:

(a) The present value of death benefits over the next ten years after the valuation date, using the anticipated mortality experience without recognition of mortality improvement beyond the valuation date for each class, is less than the present value of death benefits using the valuation basic table corresponding to the valuation table being used for that class.

(b) The present value of death benefits over the future life of the contracts, using anticipated mortality experience without recognition of mortality improvement beyond the valuation date for each class, is less than the present value of death benefits using the valuation basic table corresponding to the valuation table being used for that class.

(2) For each plan of insurance with separate rates for preferred and standard smoker lives, an insurer may use the preferred smoker and residual standard smoker tables to substitute for the smoker mortality table found in the 2017 CSO Mortality Table to determine minimum reserves. At the time of election and annually thereafter, for business valued under the preferred smoker table, the appointed actuary shall certify that:

(a) The present value of death benefits over the next ten years after the valuation date, using the anticipated mortality experience without recognition of mortality improvement beyond the valuation date for each class, is less than the present value of death benefits using the preferred smoker valuation basic table corresponding to the valuation table being used for that class.

(b) The present value of death benefits over the future life of the contracts, using anticipated mortality experience without recognition of mortality improvement beyond the valuation date for each class, is less than the present value of death benefits using the preferred smoker valuation basic table.

Guidance Note: The Valuation Manual can be updated by the NAIC to define a new valuation table. Because of the various implications to systems, form filings, and related issues (such as product tax issues), lead time is needed to implement new requirements without market disruption. It is recommended that this transition be for a period of about 4.5 years—that is, that the table be adopted by July 1 of a given year, that it be permitted to be used starting Jan. 1 of the second following calendar year, that it be optional until Jan. 1 of the fifth following calendar year, thereafter mandatory. It is further intended that the adoption of such tables would apply to all business issued since the adoption of this Valuation Manual. The details of how to implement any unlocking of mortality tables will need to be addressed in the future.

2. Interest Rates

Drafting Note: This section describing the determination of the “calendar year net premium reserve interest rate” is intended to communicate that, unlike the “unlocking” of the net premium reserve mortality and lapse assumptions, the interest rate used in the net premium reserve calculation for a block of policies issued in a particular calendar year does not change for the duration of each of the policies in that issue year block.

- a. For net premium reserve amounts calculated according to:
 - i. Section 3.B.5 for policies and riders for which nonforfeiture benefits are provided; or
 - ii. Section 3.B.6.

The calendar year net premium reserve interest rate *I* shall be determined according to this subsection 3.C.2.a and subsections 3.C.2.b and 3.C.2.c below and the results rounded to the nearer one-quarter of one percent (1/4 of 1%). This rate shall be used in determining the present values described in Subsection B of this Section for all policies issued in the calendar year next following its determination.

$$I = .03 + W * (R_1 - .03) + (W/2) * (R_2 - .09)$$

Where: R_1 is the lesser of *R* and .09

R_2 is the greater of *R* and .09

R is the reference interest rate defined in Subsection 2.b. below

W is the weighting factor for a policy, as defined in Subsection 2.c. below

However, if the calendar year net premium reserve interest rate *I* in any calendar year determined without reference to this sentence differs from the corresponding actual rate for the immediately preceding calendar year by less than one-half of one percent (1/2 of 1%), the calendar year net premium reserve interest rate shall be set equal to the corresponding actual rate for the immediately preceding calendar year.

- b. The reference interest rate *R* for a calendar year shall equal the lesser of the average over a period of 36 months and the average over a period of 12 months, ending on June 30 of the calendar year preceding the year of issue, of the monthly average of the composite yield on seasoned corporate bonds, as published by Moody’s Investors Service, Inc.
- c. The weighting factor *W* for a policy shall be determined from the table below:

<u>Guarantee Duration (Years)</u>	<u>Weighting Factor</u>
10 or less	.50
More than 10 but not more than 20	.45
More than 20	.35

The guarantee duration for the coverage guarantee is the maximum number of years the life insurance can remain in force on the basis guaranteed in the policy or under options to convert to plans of life insurance with premium rates or nonforfeiture values or both which are guaranteed in the original policy.

- d. For reserve amounts calculated according to:
 - i. Section 3.B.5 of this Section for policies and riders for which no nonforfeiture benefits are provided; or
 - ii. Section 3.B.7 of this Section.

The calendar year net premium reserve interest rate shall be calculated by increasing the rate determined according to Subsections 3.C.2.a through 3.C.2.c above by 1.5%, but in no event greater than 125% of the rate determined according to Subsection 3.C.2.a through 3.C.2.c above rounded to the nearer one-quarter of one percent (1/4 of 1%).

Drafting Note: If a policy contains multiple coverage guarantees and each coverage guarantee stream is valued separately, it may be important to define which reserve interest rate(s) should be used for reporting and analysis purposes.

3. Lapse Rates

- a. For policies other than universal life policies or riders which provide nonforfeiture values, universal life policies not containing a secondary guarantee, and universal life policies for which the longest secondary guarantee period is five years or less, the lapse rates used in determining the present values described in subsection 3.B shall be 0% per year during the premium paying period and 0% per year thereafter.
- b. For policies other than universal life policies or riders which provide no nonforfeiture values (i.e., term policies), the annual lapse rates used to determine the present values described in subsection 3.B shall vary by level premium period as stated below:
 - i. 10% per year during any level premium period of less than five years, except as noted in iii.
 - ii. 6% per year during any level premium period of five or more years, except as noted in iii.
 - iii. 10% per year during any premium paying period after an initial level premium period of less than five years.
 - iv. For policies or riders having a level premium of five years or longer, the lapse rate for the first year of the renewal premium period shall be determined based on the length of the current and renewal premium periods and the percent increase in the gross premium as shown in the table below instead of what would otherwise apply from i or ii above.

Current Premium Yrs.	Length of Renewal Prem.	Percent increase in gross premium per	Rate for first Yr. of Renewal
≤1	ART	Any	10%
1<PP≤5	ART	Any	50%
1<PP≤5	1<PP≤5	Any	25%
5<PP≤10	ART	< 400%	70%
5<PP≤10	ART	Over 400%	80%
5<PP≤10	1<PP≤5	Any	50%
5<PP≤10	5<PP≤10	Any	25%
10<PP	ART	< 400%	70%
10<PP	ART	Over 400%	80%
10<PP	1<PP≤5	Any	70%
10<PP	5<PP≤10	Any	50%
10<PP	10<PP	Any	50%

- c. For universal life policies, for which the longest secondary guarantee period is more than five years, the lapse rate, L_{x+t} , used to determine the present values described in Subsection B at time t for an insured age x at issue shall be determined as follow:

- i. Determine the ratio R_{x+t} where:

$$R_{x+t} = [FFSG_{x+t} - ASG_{x+t}] / [FFSG_{x+t} - LSG_{x+t}] \text{ but not } > 1$$

Where:

$FFSG_{x+t}$ = the fully funded secondary guarantee at time t for the insured age x at issue

ASG_{x+t} = the actual secondary guarantee at time t for the insured age x at issue

LSG_{x+t} = the level secondary guarantee at time t for the insured age x at issue

- ii. The lapse rate for the policy for durations $t+1$ and later shall be set equal to:

$$L_{x+t} = R_{x+t} \cdot 0.01 + (1 - R_{x+t}) \cdot 0.005 \cdot r_{x+t}$$

Where r_{x+t} is the ratio determined in Subsection 3.B.5.d.ii.

D. Net Premium Reserve Calculation and Cash Surrender Value Floor

1. For policies other than universal life policies, the net premium reserve shall not be less than the greater of:
 - a. The cost of insurance to the next paid to date. The cost of insurance for this purpose shall be determined using the mortality tables for the policy prescribed in subsection 3.C; or
 - b. The policy cash surrender value, calculated as of the valuation date and in a manner that is consistent with that used in calculating the net premium reserve on the valuation date.

Drafting Note: It may be appropriate to consider potential simplifications for the net premium reserve for YRT reinsurance assumed. The unearned annual tabular cost of insurance (“interpolated C_x ”) is one potential option to examine.

2. For a universal life policy, the net premium reserve shall not be less than the greater of:
 - a. The amount needed to cover the cost of insurance to the next processing date on which cost of insurance charges are deducted with respect to the policy. The cost of insurance for this purpose shall be determined using the mortality tables for the policy prescribed in subsection 3.B; or
 - b. The policy cash surrender value, calculated as of the valuation date and in a manner that is consistent with that used in calculating the net premium reserve on the valuation date.

Section 4. Deterministic Reserve

For a group of one or more policies for which a deterministic reserve must be calculated pursuant to Sections 2.A or 2.B, the company shall calculate the deterministic reserve for the group using the method described in either Subsection A or Subsection B of this section .

- A. Calculate the deterministic reserve equal to the actuarial present value of benefits, expenses, and related amounts less the actuarial present value of premiums and related amounts where:
 1. Cash flows are projected in compliance with the applicable requirements in Sections 7, 8 and 9 over the single economic scenario described in Section 7.G.1.

2. Present values are calculated using the path of discount rates for the corresponding model segment determined in compliance with Section 7.H.4.

3. The actuarial present value of benefits, expenses and related amount equals the sum of:

a. Present value of future benefits, but before netting the repayment of any policy loans;

Guidance Note: Future benefits include but are not limited to death and cash surrender benefits.

b. Present value of future expenses excluding federal income taxes and expenses paid to provide fraternal benefits in lieu of federal income taxes;

c. Policy account value invested in the separate account at the valuation date; and

Guidance Note: When c is taken in conjunction with 4.b below, the net result produces the correct cash flows as well as NAER.

d. Policy loan balance at the valuation date with appropriate reflection of any relevant due, accrued or unearned loan interest, if policy loans are explicitly modeled under Section 7.F.3.

Guidance Note: When d is taken in conjunction with 4.c below, the net result produces the correct cash flows as well as NAER.

4. The actuarial present value of premiums and related amounts equals the sum of the present values of:

a. Future gross premium payments and/or other applicable revenue;

b. Future net cash flows to or from the general account, or from or to the separate account;

c. Future net policy loan cash flows, if policy loans are explicitly modeled under Section 7.F.3;

Guidance Note: Future net policy loan cash flows include: policy loan interest paid in cash plus repayments of policy loan principal, including repayments occurring at death or surrender (note that the future benefits in Section 4.A.3.a are before consideration of policy loans), less additional policy loan principal.

d. Future net reinsurance discrete cash flows determined in compliance with Section 8;

e. The future net reinsurance aggregate cash flows allocated to this group of policies as described in Subsection B of this section; and

f. The future derivative liability program net cash flows (i.e., cash received minus cash paid) that are allocated to this group of policies.

5. If a group of policies is excluded from the stochastic reserve requirements, the company may not include future transactions associated with non-hedging derivative programs in determining the deterministic reserve for those policies.

B. Calculate the deterministic reserve as $a - b$, where

a = the aggregate annual statement value of those starting assets which, when projected along with all premium and investment income, result in the liquidation of all projected future benefits and expenses by the end of the projection horizon. Under this alternative, the following considerations apply:

1. Cash flows are projected in compliance with the applicable requirements in Section 7, Section 8 and Section 9 over the single scenario described in Section 7.G.1.

2. The requirements for future benefits and premiums in Section 4.A apply as well to the calculation of the deterministic reserve under this subsection.

b = that portion of the PIMR amount allocated under Section 7.

- C. Future net reinsurance aggregate cash flows shall be allocated as follows:
 1. Future net reinsurance aggregate cash flows shall be allocated to each policy reinsured under a given reinsurance agreement in the same proportion as the ratio of each policy's present value of future net reinsurance discrete cash flows to total present value of future net reinsurance discrete cash flows under the reinsurance agreement.
 2. Future net reinsurance aggregate cash flows allocated to a group of policies is equal to the sum of future net reinsurance aggregate cash flows allocated to each policy in the group.

Section 5. Stochastic Reserve

The company shall calculate the stochastic reserve for all policies (pursuant to section 2.A) or for a group of policies (pursuant to section 2.B) as follows:

- A. Project cash flows in compliance with the applicable requirements in Sections 7, 8 and 9 using the stochastically generated scenarios described in Section 7.G.2.
- B. Calculate the scenario reserve for each stochastically generated scenario as follows:
 1. For each model segment at the model start date and end of each projection year, calculate the discounted value of the negative of the projected statement value of general account and separate account assets using the path of discount rates for the model segment determined in compliance with Section 7.H.5 from the projection start date to the end of the respective projection year.

Guidance Note: The projected statement value of general account and separate account assets for a model segment may be negative or positive.
 2. Sum the amounts calculated in Subparagraph 1 above across all model segments at the model start date and end of each projection year.

Guidance Note: The amount in Subparagraph 2 above may be negative or positive.
 3. Set the scenario reserve equal to the sum of the statement value of the starting assets across all model segments and the maximum of the amounts calculated in Subparagraph 2 above.
- C. Rank the scenario reserves from lowest to highest.
- D. Calculate CTE 70.
- E. Determine any additional amount needed to capture any material risk included in the scope of these requirements but not already reflected in the cash flow models using an appropriate and supportable method and supporting rationale.
- F. Add the CTE amount (D) plus any additional amount (E).
- G. The stochastic reserve equals the amount determined in Subsection 5.F. If the company defines two or more subgroups for aggregation purposes as described in Section 7.B.3, the company shall calculate the amount determined in Section 5.F for each subgroup of policies on a standalone basis, and sum together those amounts for each subgroup to determine the total stochastic reserve.

Section 6. Stochastic and Deterministic Exclusion Tests

A company meeting all of the following conditions may file a statement of exemption for the current calendar year with their domestic commissioner prior to July 1 of that year certifying that these conditions are met based on premiums and other

values from the prior calendar year financial statements and that any ULSG business issued since the operative date of the Valuation Manual meets the definition for non-material secondary guarantee. The Commissioner may reject such statement prior to September 1 and require the company to follow the requirements of VM-20 for the Ordinary Life policies. Otherwise, the minimum reserve requirements for its Ordinary Life policies are those pursuant to applicable methods required in VM-A and VM-C, using the mortality as defined in Section 3.C.1 and VM-M Section 1.H. Conditions:

1. The company is a ‘small company’ for this purpose if it has less than \$300 million of ordinary life premiums¹ and, if the company is a member of an NAIC group of life insurers, the group has combined ordinary life premiums¹ of less than \$600 million,

And

2. The company reported Total Adjusted Capital of at least 450% of the authorized control level RBC in the most recent RBC report, and the appointed actuary has provided an unqualified opinion on the reserves,

And

3. Any ULSG policies issued or assumed by the company after the operative date of the valuation manual meet the definition of a non-material secondary guarantee ULSG product.

A. Stochastic Exclusion Test

1. Requirements to pass the stochastic exclusion test:

- a. Groups of policies pass the stochastic exclusion test if:

- i. Annually and within 12 months before the valuation date the company demonstrates that the groups of policies pass the stochastic exclusion ratio test defined in Section 6.A.2;
- ii. In the first year and at least once every three calendar years thereafter the company provides a demonstration in the PBR Actuarial report as specified in Section 6.A.3; or
- iii. For groups of policies other than variable life or universal life with a secondary guarantee, in the first year and at least every third calendar year thereafter the company provides a certification by a qualified actuary that the group of policies is not subject to material interest rate risk or asset return volatility risk (i.e., the risk on non-fixed-income investments having substantial volatility of returns such as common stocks and real estate investments). The company shall provide the certification and documentation supporting the certification to the commissioner upon request.

Guidance Note: The qualified actuary should develop documentation to support the actuarial certification that presents their analysis clearly and in detail sufficient for another actuary to understand the analysis and reasons for the actuary’s conclusion that the group of policies is not subject to material interest rate risk or asset return volatility risk. Examples of methods a qualified actuary could use to support the actuarial certification include, but are not limited to:

1. A demonstration that reserves for the group of policies calculated according to Sections 5–9 of VM-05, VM-A and VM-C are at least as great as the assets required to support the group of policies using the company’s cash flow testing model under each of the 16 scenarios identified in Section 6 or alternatively each of the New York 7 scenarios.
2. A demonstration that the group of policies passed the stochastic exclusion ratio test within 36 months prior to the valuation date and the company has not had a material change in its interest rate risk.
3. A qualitative risk assessment of the group of policies that concludes that the group of policies does not have material interest rate risk or asset return volatility. Such assessment would include an

¹ Premiums are measured as direct plus reinsurance assumed from an unaffiliated company from the prior calendar year annual statement.

analysis of product guarantees, the company's non-guaranteed element policy, assets backing the group of policies and the company's investment strategy.

- b. A company may not exclude a group of policies for which there is one or more clearly defined hedging strategies from stochastic reserve requirements.

2. Stochastic Exclusion Ratio Test

- a. In order to exclude a group of policies from the stochastic reserve requirements using the method allowed under Section 6.A.1.a, a company shall demonstrate that the ratio of (b-a)/c is less than 6.0% where:
 - i. a = the adjusted deterministic reserve described in subsection 6.A.2.b.i using the baseline economic scenario described in Appendix 1.
 - ii. b = the largest adjusted deterministic reserve described in subsection 6.A.2.b.i under any of the other 15 economic scenarios described in Appendix 1.
 - iii. c = an amount calculated from the baseline economic scenario described in Appendix 1 that represents the present value of benefits for the policies, adjusted for reinsurance by subtracting ceded benefits. For clarity, premium, ceded premium, expense, reinsurance expense allowance, modified coinsurance reserve adjustment and reinsurance experience refund cash flows shall not be considered "benefits," but items such as death benefits, surrender or withdrawal benefits and policyholder dividends shall be. For this purpose, the company shall use the benefits cash flows from the calculation of quantity "a," and calculate the present value of those cash flows using the same path of discount rates as used for "a."

Drafting Note: Empirical testing of the reinsurance adjustment to "iii" should encompass its impact in the case of YRT reinsurance as well as consistency of results among similar coinsurance, coinsurance with funds withheld, and modified coinsurance forms. A Guidance Note may prove necessary to address further judgment in the case of YRT.

- b. In calculating the ratio in item a above, the company:
 - i. Shall calculate an adjusted deterministic reserve for the group of policies for each of the 16 scenarios that is equal to the deterministic reserve defined in Section 4.A, but with the following differences:
 - 1. Using anticipated experience assumptions with no margins;
 - 2. Using the interest rates and equity return assumptions specific to each scenario; and
 - 3. Using net asset earned rates specific to each scenario to discount the cash flows.
 - (a) Shall use the most current available baseline economic scenario and the 15 other economic scenarios published by the NAIC. The methodology for creating these scenarios can be found in Appendix 1 of the 20.
 - (b) Shall use anticipated experience assumptions within each scenario that are dynamically adjusted as appropriate for consistency with each tested scenario.
 - (c) May not group together contract types with significantly different risk profiles for purposes of calculating this ratio.
 - (d) Mortality improvement beyond the projection start date may not be reflected in anticipated experience assumptions for the purpose of the calculating the stochastic exclusion ratio.
 - ii. Alternatively, a company may use gross premium reserves developed from the cash flows from the company's Asset Adequacy Analysis models in lieu of the deterministic reserve. In this case, the company may use the experience assumptions of the company's cash flow analysis as the anticipated

experience assumptions. The interest rates and discount rates will be those defined in b.i.2. and b.i.3. above.

3. Stochastic Exclusion Demonstration Test

- a. In order to exclude a group of policies from the stochastic reserve requirements using the method as allowed under Section 6.A.1.a.ii above, the company must provide a demonstration in the PBR Actuarial Report in the first year and at least once every three calendar years thereafter that complies with the following:
 - i. The demonstration shall provide a reasonable assurance that if the stochastic reserve was calculated on a standalone basis for the group of policies subject to the stochastic reserve exclusion, the minimum reserve for those groups of policies would not increase. The demonstration shall take into account whether changing conditions over the current and two subsequent calendar years would be likely to change the conclusion to exclude the group of policies from the stochastic reserve requirements.
 - ii. If, as of the end of any calendar year, the company determines the minimum reserve for the group of policies no longer adequately provides for all material risks, the exclusion shall be discontinued and the company fails the stochastic exclusion test for those policies.
 - iii. The demonstration may be based on analysis from a date that proceeds the initial or subsequent exclusion period.
 - iv. The demonstration shall provide an effective evaluation of the residual risk exposure remaining after risk mitigation techniques such as derivative programs and reinsurance.
- b. The company may use one of the following or another method acceptable to the commissioner to demonstrate compliance with subsection 6.A.3.a:

- i. Demonstrate that the greater of [the quantity A and the quantity B] is greater than the stochastic reserve calculated on a standalone basis, where:

A = the deterministic reserve, and

B = the net premium reserve less any associated due and deferred premium asset.

- ii. Demonstrate that the greater of [the quantity A and the quantity B] is greater than the scenario reserve that results from each of a sufficient number of adverse deterministic scenarios, where:

A = the deterministic reserve, and

B = the net premium reserve less any associated due and deferred premium asset.

- iii. Demonstrate that the greater of [the quantity A and the quantity B] is greater than the stochastic reserve calculated on a standalone basis, but using a representative sample of policies in the stochastic reserve calculations, where:

A = the deterministic reserve, and

B = the net premium reserve less any associated due and deferred premium asset.

- iv. Demonstrate that any risk characteristics that would otherwise cause the stochastic reserve calculated on a standalone basis to exceed greater of the deterministic reserve and the net premium reserve, less any associated due and deferred premium asset, are not present or have been substantially eliminated through actions such as hedging, investment strategy, reinsurance, or passing the risk on to the policyholder by contract provision.

B. Deterministic Exclusion Test

1. A group of universal life policies with a secondary guarantee that does not meet the definition of a ‘non-material secondary guarantee’ or a group of policies which is not excluded from the stochastic reserve requirement is deemed to not pass the deterministic reserve exclusion test and the deterministic reserve must be computed for this group of policies.

2. Except as provided in subsection 6.B.1, a group of policies passes the deterministic reserve exclusion test if the company demonstrates that the sum of the valuation net premiums for all future years for the group of policies, determined according to paragraph 5 below, is less than the sum of the corresponding guaranteed gross premiums for such policies. The test shall be determined on a direct or assumed basis.
3. A company may not group together policies of different contract types with significantly different risk profiles for purposes of the calculation in subsection 6.B.2.
4. If a group of policies being tested is no longer adding new issues, and the test has been passed for three consecutive years, the group passes until determined otherwise. For this group, the test must be computed at least once each five years going forward.
5. For purposes of determining the valuation net premiums used in the demonstration in subsection 6.B.2:
 - a. If pursuant to Section 2 the net premium reserve is the minimum reserve required under Section 2.A of the Standard Valuation Law for policies issued prior to the operative date of the Valuation Manual, the valuation net premiums are determined according to those minimum reserve requirements;
 - b. If the net premium reserve is determined according to Section 3.A.1, the lapse rates assumed for all durations are 0%;
 - c. For policies with guaranteed gross premium patterns that subject the policy to shock lapses, as defined in Section 3.C.3.b.iii, the valuation net premiums comparison to the guaranteed gross premiums indicated in paragraph 2 shall be performed considering only the initial premium period;
 - d. If the anticipated mortality for the group of policies exceeds the valuation mortality, then the company shall substitute the anticipated mortality to determine the net premium. For this purpose, mortality shall be measured as the present value of future death claims discounted at the valuation interest rate used for the net premium reserve.
 - e. The guaranteed gross premium is defined as:
 - i. For universal life policies, the guaranteed gross premium shall be the premium specified in the contract, or if no premium is specified, the level annual gross premium at issue 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; and
 - ii. For policies other than universal life policies, the guaranteed gross premium shall be the guaranteed premium specified in the contract.