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.

   American Academy of Actuaries Life Experience Committee and Society of Actuaries Preferred Mortality Oversight Group ("Joint" Committee), Implementation of the 2017 Guaranteed Issue Mortality 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 adopted Aug. 2016,
   - Intro – Reserve Requirement
   - VM-01 - Definitions
   - VM-02
   - VM-20 - Sections 3.A.,3.C., 9.C.
   - VM-M

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 the attached pages

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

   Based on an experience study of Guaranteed Issue business, mortality tables have been developed to be used for valuation of policies. This APF has been developed assuming the policies are in scope of VM-20 and associated principle-based reserve (PBR) requirements.

BAHNA-NOLAN Mary 8/1/2017 9:09 AM

Comment [1]: If NAIC chooses to incorporate all GI (including term) within VM-20 Deterministic and Stochastic reserves, modifications to §9.C. will also be needed for credibility and margins. These have not yet been developed. Notations where modification is needed are included within this APF.

* 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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II. Reserve Requirements

This section provides the minimum reserve requirements by type of product. All reserve requirements provided by this section relate to business issued on or after the operative date of the *Valuation Manual*. All reserves must be developed in a manner consistent with the requirements and concepts stated in the Overview of Reserve Concepts in Section I of the *Valuation Manual*.

Guidance Note: The words "policies" and "contracts" are used interchangeably.

Life Insurance Products

A. This subsection establishes reserve requirements for all contracts issued on and after the operative date of the *Valuation Manual* that are classified as life contracts defined in in the *Accounting Practices and Procedures* Manual, Statement of Statutory Accounting Principle (SSAP) No. 50 with the exception of annuity contracts and credit life contracts. Minimum reserve requirements for annuity contracts and credit life contracts are provided in other subsections of the *Valuation Manual*.

B. Minimum reserve requirements for variable and nonvariable individual life contracts—excluding preneed life contracts, industrial life contracts,[i] credit life contracts and policies of companies exempt pursuant to the companywide exemption in paragraph D below—are provided by VM-20, except for election of the transition period in paragraph C of this subsection.

Minimum reserve requirements of VM-20 are considered PBR requirements for purposes of the *Valuation Manual* and VM-31, PBR Actuarial Report Requirements for Business Subject to a Principle-Based Reserve Valuation, unless VM-20 or other requirements apply only the net premium reserve method or applicable requirements in VM-A, Appendix A – Requirements, and VM-C, Appendix C – Actuarial Guidelines.

Minimum reserve requirements for life contracts not subject to VM-20 are those pursuant to applicable requirements in VM-A and VM-C.

C. A company may elect to establish minimum reserves pursuant to applicable requirements in VM-A and VM-C for business otherwise subject to VM-20 requirements and issued during the first three years following the operative date of the *Valuation Manual*. A company electing to establish reserves using the requirements of VM-A and VM-C may elect to use:

- The 2017 Commissioners' Standard Ordinary (CSO) Tables as the mortality standard following the conditions outlined in VM-20 Section 3. If a company during the three years elects to apply VM-20 to a block of such business, then a company must continue to apply the requirements of VM-20 for future issues of this business.

- For Guaranteed Issue life insurance policies issued January 1, 2019 or later, the 2017 Commissioner's Standard Guaranteed Issue Mortality table as defined in VM-M Otherwise the applicable CSO table applies.

VM-01

Definition XX – Guaranteed Issue Life Insurance Policy: A policy or certificate where the applicant must be accepted for coverage if the applicant is eligible. Eligibility requirements may include:

- Being within a specified age range
- Being an active member in an eligible group (e. g. group solicitation in direct marketing)

Inclusion in any of the following characteristics or product types disqualifies the policy as GI:

- Actively at work requirement
- Employer groups
- Acceptance based on any health related questions or information
- Waiving of underwriting requirements based on minimum participation thresholds, such as for worksite marketing
- Corporate- / Bank Owned Life Insurance (COLI / BOLI)
- Credit Life Insurance
- Juvenile-only products (e. g., under age 15)
- Pre-Need

All remaining definitions need to be renumbered plus 1

BAHNA-NOLAN Mary 8/1/2017 9:37 AM
Comment [2]: This would currently be definition 26 and all subsequent definitions would need to be renumbered.

John Bruins 6/16/2017 1:23 PM
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Section 5: Mortality

Guidance Note: As any new Commissioners' Standard tables are adopted in the future, language or paragraphs will need to be added here to define what business is to use which tables. This will need to be coordinated with the valuation requirements contained in other sections of the *Valuation Manual*. 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. Thus, it is recommended that the transition period referenced in the guidance note in Section 3.C.1.b of VM-20 be adopted; that is, that there be a transition period of about 4.5 years, 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.

A. Ordinary Life Insurance Policies

1. For ordinary life insurance policies issued on or after Jan. 1, 2017, and prior to Jan. 1, 2020, except as provided in paragraph 2 and in Subsections B and E below, the minimum nonforfeiture standard shall be determined using the 2001 CSO Mortality Table as defined in Appendix M of this manual and subject to the conditions defined in VM-A-814 in Appendix A of this manual for using this mortality table and subject for minimum standards. The 2001 CSO Preferred Class Structure Tables shall not be used to determine the minimum nonforfeiture standard.

2. Subject to the conditions stated below, the 2017 CSO Mortality Table as defined in VM-M Section 1.H.:

   a. May, at the election of the company, for one or more specified plans of insurance issued on or after Jan. 1, 2017.

   b. Shall, for policies issued on or after Jan. 1, 2020, to which section 5cH(6) of the *Standard Nonforfeiture Law for Life Insurance* (#808) is applicable, be used to determine minimum nonforfeiture standards according to the Model #808 or the state's equivalent statute. The 2017 CSO Preferred Structure Tables shall not be used to determine the minimum nonforfeiture standard.

3. The following conditions shall apply with respect to the use of the 2017 CSO Mortality Table:

   a. For each plan of insurance with separate rates for smokers and nonsmokers, an insurer may use:

      i. Composite mortality tables to determine minimum cash surrender values and amounts of paid-up nonforfeiture benefits.

      ii. Smoker and nonsmoker mortality to determine minimum cash surrender values and amounts of paid-up nonforfeiture benefits.

   b. For plans of insurance without separate rates for smokers and nonsmokers, the composite mortality tables shall be used.

   c. For the purpose of determining minimum cash surrender 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.

   d. Gender-blended tables shall apply in the following circumstances:

      For any ordinary life insurance policy delivered or issued for delivery that uses 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 cash surrender values and amounts of paid-up nonforfeiture benefits.

B. Pre-Need Life Insurance Policies

Pre-need life insurance policies issued on or after the operative date of this *Valuation Manual* shall have the minimum nonforfeiture standard computed based on the 1980 CSO Mortality Tables as defined in Appendix M.

C. Same Minimum Nonforfeiture Standard for Men and Women

For any ordinary life insurance policy that uses 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, the minimum nonforfeiture standard shall use the gender-blended mortality derived from the mortality table assigned in this VM-02 for use in determining the minimum nonforfeiture standard. Weights used to determine the gender-blended table shall follow those provided in the *NAIC Procedure for Permitting Same Minimum Nonforfeiture Standards for Men and Women Insured Under 1980 CSO and CET Tables* (#811). The company may choose from among the blended tables, as appropriate, developed by the Academy CSO Task Force and adopted by the NAIC in December 2002 (preceding sentence taken from the Recognition of the 2001 CSO Mortality Table for Use in Determining Minimum Reserve Liabilities and Nonforfeiture Benefits Model Regulation [#814], Section 7, B). These tables are defined in Appendix M under Gender Blended Tables.

D. Industrial Life Insurance

The minimum nonforfeiture standard values for industrial life insurance policies shall be determined using the 1961 Industrial Standard Mortality Tables as defined in Appendix M.

E. Guaranteed Issue Life Insurance

The minimum nonforfeiture standard values for Guaranteed Issue Life Insurance policies issued after December 31, 2021, shall be determined using the 2017 Commissioners Standard Guaranteed Issue Mortality Tables defined in VM-M. The company may elect to use the 2017 Commissions Standard Guaranteed Issue Mortality Tables in place of the tables defined in subsection A.1. above for policies issued January 1, 2019 or later.

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Section 3: Net Premium Reserve

A. Applicability

1. The NPR for each term policy other than those meeting the requirements of a Guaranteed issue Life Insurance Policy and for each Universal Life with Secondary Guarantees (ULSG) policy must be determined pursuant to Section 3.

> **Guidance Note:** When valuing term riders pursuant to Section II, the reserve requirements for term policies are applicable.

2. Except for policies subject to Section 3.A.1, 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/or in VM-M Section 1

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Section 3: Net Premium Reserve

A. Applicability

1. The Net Premium Reserve NPR for each term policy other than those meeting the requirements of a Guaranteed Issue Life Insurance Policy and for each Universal Life with Secondary Guarantees (ULSG) policy must be determined pursuant to Section 3.

> **Guidance Note:** When valuing term riders pursuant to Section II, the reserve requirements for term policies are applicable.

2. Except for policies subject to Section 3.A.1, 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/or in VM-M Section 1

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C. Net Premium Reserve Assumptions

1. Mortality Rates

a. Except as indicated in Subsections 3.C.1.b, or 3.C.1.f., and subject to the conditions outlined for reserves in VM-A-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 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 CSO Mortality Tables as defined in VM-M Section 1.H. is required as the valuation standard for ordinary life policies issued on or after Jan. 1, 2020, and subject to this Section. 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 Jan. 1, 2017.

c. Conditions for application of the 2017 CSO:

i. 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.

ii. For plans of insurance without separate rates for smokers and nonsmokers, the composite mortality tables shall be used.

iii. 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.

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 Jan. 1, 2017.

e. Conditions for preferred structure tables:

i. 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 10 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 VBT 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 VBT corresponding to the valuation table being used for that class.

ii. 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 10 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 VBT 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 VBT. iii. Selection of the proper set of mortality rates when a company chooses to use a permitted preferred class structure mortality table shall be subject to *Actuarial Guideline XLII—The Application of the Model Regulation Permitting the Recognition of Preferred Mortality Tables for Use in Determining Minimum Reserve Liabilities* (AG 42) and applied to the 2017 CSO consistently with the 2001 CSO.

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.

f. For Guaranteed Issue Life Insurance Policies, the 2017 Commissioners Standard Guaranteed Issue Mortality Tables as defined in VM-M Section 1. is required as the valuation standard for ordinary life policies issued on or after Jan. 1, 2022, and subject to this Section, 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 Jan. 1, 2019.

Section 9: Assumptions

C. Mortality Assumptions

1. Procedure for Setting Prudent Estimate Mortality Assumptions

   a. The company shall determine mortality segments for the purpose of determining separate prudent estimate mortality assumptions for groups of policies that the company expects will have different mortality experience than other groups of policies (such as male vs. female, smoker vs. non-smoker, preferred vs. super-preferred vs. residual, etc.).

   b. For each mortality segment, the company shall establish prudent estimate mortality assumptions using the following procedure:

      i. Determine the company experience mortality rates as provided in Subsection 9.C.2. If company experience data is limited or not available, the company can use an applicable industry basic table in lieu of company experience as provided in Subsection 9.C.3.

      ii. If the company determines company experience mortality rates as provided in Subsection 9.C.2, then use the procedure described in Subsection 9.C.3 to determine the applicable industry table for each mortality segment to grade company experience to the industry table.

      iii. Determine the level of credibility of the underlying company experience as provided in Subsection 9.C.4.

      iii. Determine the prescribed mortality margins as provided in Subsection 9.C.5. Separate mortality margins are determined for company experience mortality rates and for the applicable industry basic tables.

      v. Use the procedure described in Subsection 9.C.6 to determine the prudent estimate assumptions.

2. Determination of Company Experience Mortality Rates

   a. For each mortality segment, the company shall determine company experience mortality rates derived from company experience data. If company experience data is not available or limited, the company can choose to use an applicable industry basic table in lieu of its own company experience, as provided in Subsection 9.C.3.

   b. Company experience data shall be based on experience from the following sources:

      i. Actual company experience for books of business within the mortality segment.

      ii. Experience from other books of business within the company with similar underwriting.

      iii. Experience data from other sources, if available and appropriate, such as actual experience data of one or more mortality pools in which the policies participate under the term of a reinsurance agreement. Data from other sources is appropriate if the source has underwriting and expected mortality experience characteristics that are similar to policies in the mortality segment.

   c. The company experience mortality rates shall not be lower than the mortality rates the company expects to emerge, which the company can justify and which are disclosed in the PBR Actuarial Report.

d. When determining the company experience mortality rates for each mortality segment, the company can base the mortality on more aggregate experience and use other techniques to further subdivide the aggregate class into various subclasses or mortality segments (e.g., start with aggregate non-smoker then use the conservation of total deaths principle, normalization or other approach to divide the aggregate mortality into super preferred, preferred and residual standard non-smoker class assumptions). In doing so, the company must ensure that when the mortality segments are weighted together, the total number of expected claims is not less than the company experience data for the aggregate class.

e. The company shall review, and update as needed, the company experience data described in Subsection 9.C.2.b, whether based on actual experience or data from other sources, at least every three years. If updated experience becomes available prior to the end of three years since the last review or update, which alters the company's expected mortality for the mortality segments in a significant manner and such impact is expected to continue into the future, the company shall reflect the changes implied by the updated data in the current year.

   i. The company experience data for each mortality segment shall include the most recent experience study and shall include the in force and claim data pertaining to the study period for all policies currently in the mortality segment or that would have been in the mortality segment at any time during the period over which experience is being evaluated.

   ii. The period of time used for the experience study should be at least three exposure years and should not exceed 10 exposure years.

f. The company may remove from the company experience data any policies for which the experience is reflected through adjustments to the prudent estimate assumptions as provided under Subsection 9.C.6.e below, including policies insuring impaired lives and those for which there is a reasonable expectation, due to conditions such as changes in premiums or other policy provisions, that policyholder behavior will lead to mortality results that vary significantly from those that would otherwise be expected.

   The company may adjust the company experience rates for each mortality segment to reflect the expected incremental change due to the adoption of risk selection and underwriting practices different from those underlying the company experience data identified above, provided that:

   i. The adjustments are supported by published medical or clinical studies or other published studies that correlate a specific risk selection criteria to mortality or longevity experience (for example, criterion and correlations determined through predictive analytics).

   ii. The rationale and support for the use of the study and for the adjustments are disclosed in the PBR Actuarial Report.

Guidance Note: It is anticipated that the adjustment described in Subsection 9.C.2.f to experience will rarely be made. Since these adjustments are expected to be rare, and since it is difficult to anticipate the nature of these adjustments, the commissioner may wish to determine the level of documentation or analysis that is required to allow such adjustments. The NAIC may want to consider whether approval by a centralized examination office would be an acceptable alternative to approval by the commissioner.

g. Mortality improvement shall not be incorporated beyond the valuation date. However, historical mortality improvement from the central point of the underlying company experience data to the valuation date may be incorporated.

3. Determination of Applicable Industry Basic Tables

a. The industry basic table shall be based on the most recent VBT listed in VM-M Section 2, including the Primary, Limited Underwriting and RR Table forms, if available. The industry basic table used should be based on the table form that most appropriately reflects the risk characteristics of the respective mortality segment.

b. A modified industry basic table is permitted in a limited number of situations where an industry basic table does not appropriately reflect the expected mortality experience, such as joint life mortality, simplified underwriting, or substandard or rated lives. In cases other than modification of the table to reflect joint life mortality, the modification must not result in mortality rates lower than those in the industry basic table without approval by the commissioner.

c. The company may apply the underwriting criteria scoring procedure described in Subparagraph d below to determine:

    i. The industry basic table that can serve as the industry experience rates when company experience data is limited or not available.

    ii. The applicable industry basic table for grading company experience mortality to industry experience mortality using the grading method described in Subsection 9.C.6.b.iii.

d. The underwriting criteria scoring procedure is the algorithm embedded in the Underwriting Criteria Score Calculator, adopted by the Life Actuarial (A) Task Force and maintained on the Society of Actuaries (SOA) website, (*www.soa.org/Research/Experience-Study/Ind-Life/Valuation/relativerisktool.aspx*), which is used to score every risk class in a preferred risk class structure. The scoring is based on the specific underwriting criteria used by a company.

    i. In using the underwriting criteria scoring procedure to determine the appropriate industry basic table for a particular mortality segment, the company shall take into account factors that are not recognized in the underwriting scoring algorithm but are applicable to policies issued in that mortality segment.

Guidance Note: Examples of such factors include the number of underwriting exceptions that are made, the quality and experience level of the underwriters, and characteristics of the distribution system. For example, if a company deviates from its preferred criteria on a regular basis, then it needs to take that into consideration since the underwriting criteria scoring procedure is not designed to quantify that risk.

    ii. In using the underwriting criteria scoring procedure to determine the appropriate industry basic table for policies that are issued subject to simplified underwriting and policies that are issued without underwriting, the company shall take into account factors not recognized in the underwriting scoring algorithm but are applicable to such policies.

    iii. In taking into account factors that are not recognized in the underwriting scoring algorithm, a company may, to the extent it can justify, adjust the industry basic tables up or down two tables from that determined by application of the underwriting criteria scoring procedures. Further adjustments to reflect risk characteristics not captured within the Underwriting Criteria Scoring (UCS) Tool may be allowed upon approval by the commissioner.

e. As an alternative to the UCS Tool, the company may use other actuarially sound methods to determine the applicable basic tables related to subdivisions of mortality segments. The company shall document the analysis performed to demonstrate the applicability of the chosen method and resulting choice in tables and reasons why the results using the UCS Tool may not be suitable.

Guidance Note: For example, the company may determine a more all-inclusive basic table as a table appropriate for the whole mortality segment (appropriately modified by the removal of classified lives, term conversions or any other legitimately excludable class) and then subdivide that segment using actuarially sound methods including, but not limited to, the UCS.

f. If no industry basic table appropriately reflects the risk characteristics of the mortality segment, the company may use any well-established industry table that is based on the experience of policies having the appropriate risk characteristics in lieu of an industry basic table.

Guidance Note: Subsection 9.C.3.f above is intended to provide flexibility needed to handle products based on group-type mortality, etc., for which there might not be an industry basic table.

g. Mortality improvement shall not be incorporated beyond the valuation date. However, historical mortality improvement from the date of the industry basic table (e.g., 2015 for the 2015 VBT) to the valuation date may be incorporated using the improvement factors for the applicable industry basic table as determined by the SOA and published on the SOA website: *www.soa.org/Research/Experience-Study/Ind-Life/Valuation/research-YYYY-improve-scale-recommendation.aspx*.

Guidance Note: The improvement factors for the industry basic table will be determined by the SOA. YYYY is the calendar year of valuation.

Guidance Note: The start date for the improvement factors to be applied to the industry basic tables differs from that used for determining company experience mortality rates as described in Subsection 9.C.2.g, as the industry basic tables have already been improved from the mid-point of the exposure period of the data underlying the table to the start date of the table—e.g., the 2015 VBT has already been improved from the mid-point of the underlying data supporting the table to 2015.

4. Credibility of Company Experience

BAHNA-NOLAN Mary 8/1/2017 3:40 PM
Comment [3]: A new section will need to be developed to reflect the credibility procedures using the GI CSO table as the Buhlmann credibility formula is only applicable for the 2015 VBT table.

a. For valuations in which the industry basic mortality table is the 2008 VBT, determine an aggregate level of credibility over the entire exposure period using a methodology to determine the level of credibility that follows common actuarial practice as published in actuarial literature (for example, but not limited to, the Limited Fluctuation Method or Bühlmann Empirical Bayesian Method).

For valuations in which the industry basic mortality table is the 2015 VBT, determine an aggregate level of credibility following either the Limited Fluctuation Method by amount, such that the minimum probability is at least 95% with an error margin of no more than 5% or Bühlmann Empirical Bayesian Method by amount. Once chosen, the credibility method must be applied to all business subject to VM-20 and requiring credibility percentages. A company seeking to change credibility methods must request and subsequently receive the approval of the commissioner. The request must include the justification for the change and a demonstration of the rationale supporting the change. The formula to determine the credibility level by amount under the Limited Fluctuation Method is as follows:

$$\text{Limited Fluctuation } Z = \min\{1, rm/z\sigma\}$$

where,

r = error margin ≤ 5%
z = normal distribution quantile ≥ 95%
m = mortality ratio, i.e. actual to expected (A/E) ratio by amount
σ = standard deviation of the mortality ratio

The following formula can be used in conjunction with the 2015 VBT industry table to directly approximate the credibility based on the Bühlmann Empirical Bayesian Method:

$$\text{Bühlmann Z} = \frac{A}{A + \frac{(109\% * B) - (121\% * C)}{(0.019604 * A)}}$$

Where,

A = Sum of expected deaths by amount = Σ (amount insured) x (exposure) x (mortality)
B = Σ(amount insured)² x (exposure) x (mortality)
C = Σ(amount insured)² x (exposure)² x (mortality)²

b. Credibility may be determined at either the mortality segment level or at a more aggregate level if the mortality for the sub-classes (mortality segments) was determined using an aggregate level of mortality experience.

c. A single level of credibility shall be determined over the entire exposure period, rather than for each duration, within the exposure period. This overall level of credibility will be used to:

i. Determine the prescribed margin for company experience mortality rates.

ii. Determine the grading period (shown in column (1) in the table in Subsection 9.C.6.b.iii) for grading company experience mortality rates into the applicable industry basic table.

5. Prescribed Mortality Margins

BAHNA-NOLAN Mary 8/1/2017 3:42 PM
Comment [4]: Separate margin tables will need to be developed if GI is included in the deterministic and stochastic reserve determination.

a. Separate prescribed margins will be added to company experience mortality rates and to the applicable industry basic tables. The mortality margin shall be in the form of a prescribed percentage increase applied to each mortality rate.

b. The prescribed margin percentages for the company experience mortality rates will vary by attained age (att age), by the level of credibility of the underlying company experience, based on the level of credibility and the method used to determine the credibility in Subsection 9.C.4. The percentages are given in the following tables. To determine the margin percentage for each table, round the credibility level amount to the nearest whole integer.

i. For valuations in which the industry mortality table is the 2008 VBT limited underwriting table:

	Credibility Level				
Att Age	0%–19%	20%–39%	40%–59%	60%–79%	80%–100%
<45	21.0%	13.7%	8.4%	6.3%	5.3%
46–47	20.0%	13.0%	8.0%	6.0%	5.0%
48–49	19.0%	12.4%	7.6%	5.7%	4.8%
50–51	18.0%	11.7%	7.2%	5.4%	4.5%
52–53	17.0%	11.1%	6.8%	5.1%	4.3%
54–55	16.0%	10.4%	6.4%	4.8%	4.0%
56–57	15.0%	9.8%	6.0%	4.5%	3.8%
58–59	14.0%	9.1%	5.6%	4.2%	3.5%
60–61	13.0%	8.5%	5.2%	3.9%	3.3%
62–63	12.0%	7.8%	4.8%	3.6%	3.0%
64–68	11.0%	7.2%	4.4%	3.3%	2.8%

69–76 10.0% 6.5% 4.0% 3.0% 2.5%
77+ 9.0% 5.9% 3.6% 2.7% 2.3%

ii. For valuations in which the industry mortality table is the 2015 VBT and where the credibility is determined using the Bühlmann Empirical Bayesian Method by amount method:

Bühlmann Margins

Credibility Level												
Att Age	0%–7%	8%–12%	13%–17%	18%–22%	23%–27%	28%–32%	33%–37%	38%–42%	43%–47%	48%–52%	53%–57%	58%–62%
<47	20.4%	20.4%	20.4%	20.4%	20.0%	19.3%	18.6%	17.9%	17.1%	16.3%	15.5%	14.6%
46–47	20.2%	20.2%	20.2%	20.2%	20.0%	19.3%	18.6%	17.9%	17.1%	16.3%	15.5%	14.6%
48–49	20.0%	20.0%	20.0%	20.0%	19.7%	19.1%	18.4%	17.6%	16.9%	16.1%	15.3%	14.4%
50–51	19.8%	19.8%	19.8%	19.8%	19.4%	18.8%	18.1%	17.4%	16.7%	15.9%	15.1%	14.2%
52–53	19.6%	19.6%	19.6%	19.6%	19.1%	18.5%	17.8%	17.1%	16.4%	15.6%	14.8%	14.0%
54–55	19.2%	19.2%	19.2%	19.2%	18.8%	18.2%	17.5%	16.8%	16.1%	15.4%	14.6%	13.7%
56–57	18.9%	18.9%	18.9%	18.9%	18.5%	17.9%	17.2%	16.5%	15.8%	15.1%	14.3%	13.5%
58–59	18.5%	18.5%	18.5%	18.5%	18.1%	17.5%	16.9%	16.2%	15.5%	14.8%	14.1%	13.2%
60–61	18.2%	18.2%	18.2%	18.2%	17.8%	17.2%	16.5%	15.9%	15.2%	14.5%	13.8%	13.0%
62–63	17.8%	17.8%	17.8%	17.8%	17.4%	16.8%	16.2%	15.6%	14.9%	14.2%	13.5%	12.7%
64–65	17.4%	17.4%	17.4%	17.4%	17.0%	16.4%	15.8%	15.2%	14.6%	13.9%	13.2%	12.4%
66–67	16.9%	16.9%	16.9%	16.9%	16.6%	16.0%	15.4%	14.8%	14.2%	13.5%	12.8%	12.1%
68–69	16.5%	16.5%	16.5%	16.5%	16.2%	15.6%	15.0%	14.5%	13.8%	13.2%	12.5%	11.8%
70–71	16.1%	16.1%	16.1%	16.1%	15.7%	15.2%	14.6%	14.1%	13.5%	12.8%	12.2%	11.5%
72–73	15.6%	15.6%	15.6%	15.6%	15.3%	14.7%	14.2%	13.7%	13.1%	12.5%	11.8%	11.1%
74–75	15.1%	15.1%	15.1%	15.1%	14.8%	14.3%	13.8%	13.2%	12.7%	12.1%	11.5%	10.8%
76–77	14.6%	14.6%	14.6%	14.6%	14.3%	13.8%	13.3%	12.8%	12.2%	11.7%	11.1%	10.4%
78–79	14.1%	14.1%	14.1%	14.1%	13.8%	13.3%	12.8%	12.3%	11.8%	11.3%	10.7%	10.1%
80–81	13.6%	13.6%	13.6%	13.6%	13.3%	12.8%	12.4%	11.9%	11.4%	10.8%	10.3%	9.7%
82–83	13.0%	13.0%	13.0%	13.0%	12.7%	12.3%	11.9%	11.4%	10.9%	10.4%	9.9%	9.3%
84–85	12.5%	12.5%	12.5%	12.5%	12.2%	11.8%	11.4%	10.9%	10.4%	10.0%	9.4%	8.9%
86–87	11.9%	11.9%	11.9%	11.9%	11.6%	11.2%	10.8%	10.4%	10.0%	9.5%	9.0%	8.5%
88–89	11.3%	11.3%	11.3%	11.3%	11.1%	10.7%	10.3%	9.9%	9.5%	9.0%	8.6%	8.1%
90–91	10.7%	10.7%	10.7%	10.7%	10.5%	10.1%	9.7%	9.4%	9.0%	8.5%	8.1%	7.6%
92–93	10.1%	10.1%	10.1%	10.1%	9.8%	9.5%	9.2%	8.8%	8.4%	8.0%	7.6%	7.2%
94–95	9.4%	9.4%	9.4%	9.4%	9.2%	8.9%	8.6%	8.3%	7.9%	7.5%	7.1%	6.7%
96–97	8.8%	8.8%	8.8%	8.8%	8.6%	8.3%	8.0%	7.7%	7.4%	7.0%	6.6%	6.3%
98–99	8.1%	8.1%	8.1%	8.1%	7.9%	7.7%	7.4%	7.1%	6.8%	6.5%	6.1%	5.8%
100–101	7.4%	7.4%	7.4%	7.4%	7.3%	7.0%	6.8%	6.5%	6.2%	5.9%	5.6%	5.3%
102–103	6.7%	6.7%	6.7%	6.7%	6.6%	6.3%	6.1%	5.9%	5.6%	5.4%	5.1%	4.8%
104–105	6.0%	6.0%	6.0%	6.0%	5.9%	5.7%	5.5%	5.2%	5.0%	4.8%	4.5%	4.3%
106 and over	5.3%	5.3%	5.3%	5.3%	5.1%	5.0%	4.8%	4.6%	4.4%	4.2%	4.0%	3.8%
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VM-M: APPENDIX M MORTALITY TABLES

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Section 1: Valuation Mortality Tables M-1

Section 2: Industry Experience Valuation Basic Tables M-3

Definitions

A. "Composite mortality table" means a mortality table with rates of mortality that do not distinguish between smokers and nonsmokers.

B. "Smoker and nonsmoker mortality table" means a mortality table with separate rates of mortality for smokers and nonsmokers.

Section 1: Valuation Mortality Tables

A. 1959 Accidental Death Benefits Table

B. 1961 Commissioners Standard Industrial Mortality Table

Composite Table (1961 CSI)

Proceedings of the NAIC, 1961 Volume II: pages 538–540

C. 1961 Commissioners Industrial Extended Term Insurance Table

Composite Table (1961 CIET)

Proceedings of the NAIC, 1961 Volume II: pages 541–543

D. 1980 CSO Mortality Tables

1. Composite tables (with optional 10-Year Select Mortality Factors) (1980 CSO)

Proceedings of the NAIC, 1980 Volume I: page 598

2. Smoker/Nonsmoker tables (1980 CSO NS and 1980 CSO SM)

Proceedings of the NAIC, 1984: pages 406–413

3. Blended tables (1980 CSO B, 1980 CSO C, 1980 CSO D, 1980 CSO E, 1980 CSO F)

Proceedings of the NAIC, 1984: pages 396–400

E. 1980 Commissioners Extended Term Insurance Tables

1. Composite Tables (1980 CET)

Proceedings of the NAIC, 1980 Volume I: page 619

2. Smoker/Nonsmoker tables (1980 CET NS and 1980 CET SM)

Proceedings of the NAIC, 1984: pages 406–413

3. Blended tables (1980 CET B, 1980 CET C, 1980 CET D, 1980 CET E, 1980 CET F)

   Proceedings of the NAIC, 1984: pages 396–400

F. 1983 Group Annuity Mortality Table Without Projection

G. 2001 Commissioners Standard Ordinary Mortality Tables (2001 CSO)

1. "2001 CSO Mortality Table" means that mortality table, consisting of separate rates of mortality for male and female lives, developed by the Academy CSO Task Force from the Valuation Basic Mortality Table developed by the SOA Individual Life Insurance Valuation Mortality Task Force, and adopted by the NAIC in December 2002. The 2001 CSO Mortality Table is included in the *Proceedings of the NAIC* (2nd Quarter 2002). Unless the context indicates otherwise, the "2001 CSO Mortality Table" includes both the ultimate form of that table and the select and ultimate form of that table and includes both the smoker and nonsmoker mortality tables and the composite mortality tables. It also includes both the age-nearest-birthday and age-last-birthday bases of the mortality tables.

2. "2001 CSO (F)" means that mortality table consisting of the rates of mortality for female lives from the 2001 CSO Mortality Table.

3. "2001 CSO (M)" means that mortality table consisting of the rates of mortality for male lives from the 2001 CSO Mortality Table.

4. "2001 CSO Preferred Class Structure Mortality Table" means mortality tables with separate rates of mortality for super preferred nonsmokers, preferred nonsmokers, residual standard nonsmokers, preferred smokers and residual standard smoker splits of the 2001 CSO Nonsmoker and Smoker Tables, as adopted by the NAIC at the September, 2006 national meeting and published in the NAIC *Proceedings* (third-quarter 2006). Unless the context indicates otherwise, the "2001 CSO Preferred Class Structure Mortality Table" includes both the ultimate form of that table and the select and ultimate form of that table. It includes both the smoker and nonsmoker mortality tables. It includes both the male and female mortality tables and the gender composite mortality tables. It also includes both the age-nearest-birthday and age-last-birthday bases of the mortality table.

H. 2017 CSO Mortality Tables

1. "2017 CSO Mortality Table" means that mortality table, consisting of separate rates of mortality for male and female lives, developed by the CSO Subgroup of the Joint Academy Life Experience Committee and SOA Preferred Mortality Oversight Group from the 2015 Valuation Basic Mortality Table developed by the joint group's Valuation Basic Mortality Subgroup, and adopted by the NAIC in April 2016. The 2017 CSO Mortality Table is included in the Proceedings of the NAIC (1st Quarter 2016). Unless the context indicates otherwise, the "2017 CSO Mortality Table" includes both the ultimate form of that table and the select and ultimate form of that table and includes both the smoker and nonsmoker mortality tables and the composite mortality tables. It also includes both the age-nearest-birthday and age-last-birthday bases of the mortality tables.

2. "2017 CSO (F)" means that the mortality table consisting of the rates of mortality for female lives from the 2017 CSO Mortality Table.

3. "2017 CSO (M)" means that the mortality table consisting of the rates of mortality for male lives from the 2017 CSO Mortality Table.

4. "2017 CSO Preferred Class Structure Mortality Table" means those mortality tables with separate rates of mortality for super preferred nonsmokers, preferred nonsmokers, residual standard nonsmokers, preferred smokers and residual standard smoker splits of the 2017 CSO Nonsmoker and Smoker Tables as adopted by the NAIC at the 2016 Spring National Meeting and published in the NAIC *Proceedings* (first-quarter 2016). Unless the context indicates otherwise, the "2017 CSO Preferred Class Structure Mortality Table" includes both the ultimate form of that table and the select and ultimate form of that table. It includes both the smoker and nonsmoker mortality tables. It includes both the male and female mortality tables. It also includes both the age-nearest-birthday and age-last-birthday bases of the mortality table.

I. 2012 Individual Annuity Reserve Valuation Table

1. Definitions

a. "2012 IAR Table" means that generational mortality table developed by the Joint Academy /SOA Payout Annuity Table Team and containing rates, $q_{x2012+n}$, derived from a combination of the 2012 IAM Period Table and Projection Scale G2, using the methodology stated in the "Application of the 2012 IAR Mortality Table" paragraph of Appendix A-821 of the AP&P Manual.

b. "2012 Individual Annuity Mortality Period Life (2012 IAM Period) Table" means the Period Table containing loaded mortality rates for calendar year 2012. This table contains rates, q_{x2012}, developed by the Joint Academy /SOA Payout Annuity Table Team and is shown in Appendices 1–2 of Appendix A-821 of the AP&P Manual.

c. "Projection Scale G2 (Scale G2)" is a table of annual rates, $G2_x$, of mortality improvement by age for projecting future mortality rates beyond calendar year 2012. This table was developed by the Joint Academy/SOA Payout Annuity Table Team and is shown in Appendices 3–4 of Appendix A-821 of the AP&P Manual.

2. Application of the 2012 IAR Mortality Table

In using the 2012 IAR Mortality Table, the mortality rate for a person age x in year (2012 + n) is calculated as follows:

$$q_{x^{2012+n}} = q_{x^{2012}}(1-G2_x)^n$$

The resulting $q_{x^{2012+n}}$ shall be rounded to three decimal places per 1,000, e.g., 0.741 deaths per 1,000. Also, the rounding shall occur according to the formula above, starting at the 2012 period table rate.

For example, for a male age 30, $q_{x^{2012}} = 0.741$.
$q_{x^{2013}} = 0.741 * (1 - 0.010) ^ 1 = 0.73359$, which is rounded to 0.734.
$q_{x^{2014}} = 0.741 * (1 - 0.010) ^ 2 = 0.7262541$, which is rounded to 0.726.

A method leading to incorrect rounding would be to calculate $q_{x^{2014}}$ as $q_{x2013} * (1 - 0.010)$, or 0.734 * 0.99 = 0.727. It is incorrect to use the already rounded q_{x2013} to calculate q_{x2014}.

J. 2017 Commissioners Standard Guaranteed Issue Mortality Tables

"2017 Commissioners Standard Guaranteed Issue Mortality Table" (2017 CSGI) means that mortality table, consisting of separate rates of mortality for male and female lives, as well as combined unisex rates, developed by the Guaranteed Issue/Simplified Issue/Pre-Need Working Group of the American Academy of Actuaries' Life Experience Committee and the SOA Preferred Mortality Oversight Group from the experience collected from 2005 – 2009. This table was adopted by the NAIC at the yy/yy/yyyy Meeting,

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and is included in the Proceedings of the NAIC (date TBD). This table must be used for guaranteed issue life insurance policies issued on or after January 1, 2022.

Section 2: Industry Experience Valuation Basic Tables

A. 2008 Valuation Basic Table (2008 VBT)

B. 2015 Valuation Basic Table (2015 VBT)

The 2015 Valuation Basic Table is a valuation table without loads jointly developed by the Academy and SOA for use in determining a company's prudent estimate mortality assumption for valuations of Dec. 31, 2015, and later. The table consists of the Primary table (Male, Female, Smoker, Non-smoker and Composite), 10 Relative Risk tables for nonsmokers (male and female) and four Relative Risk tables for smokers (male and female). Rates for juvenile ages are included in the composite tables. The tables are on a select and ultimate and ultimate only basis, and are available on an age nearest and an age last birthday basis.

C. 2017 Guaranteed Issue Valuation Basic Table (2017 GI-VBT)

The 2017 Guaranteed Issue Valuation Basic Table is a valuation table without loads jointly developed by the Academy and SOA for use in determining a company's prudent estimate mortality assumption for valuations of Dec. 31, 2019, and later for guaranteed issue life insurance policies. The table consists of a select and ultimate, and ultimate only forms, unismoke only, male, female and unisex.