AMERICAN ACADEMY *of* ACTUARIES

**Requirements for Principles-Based Reserves for Life Products
from the American Academy of Actuaries' Life Reserves Work Group**

**Presented to the National Association of Insurance Commissioners'
Life and Health Actuarial Task Force**

New York City, NY – March 2007

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The NAIC solicits comments on this draft. Comments should be sent to Randall Stevenson, NAIC, at rstevens@naic.org. Revision marks show changes from the 12/7/06 draft.

At the request of the NAIC, the 3 Life Reserve Work Group (LRWG) documents exposed for comment at the December meeting (the Model Regulation, Guideline PBR-VAL and Guideline AG DIS) have been combined into a single document using a "requirements format" that is the common template that will be used for all requirements placed in the Valuation Manual. Thus, this draft of the LRWG proposal is now in a form that is ready to be placed in the designated section of the Valuation Manual. Please note that the template following this "requirements format" is not final, but putting the LRWG proposal into this format will provide an example of what the Valuation Manual might look like.

SECTION [TBD]: REQUIREMENTS FOR PRINCIPLES-BASED RESERVES FOR LIFE PRODUCTS ~~MODEL REGULATION~~

Table of Contents

~~Subs~~Section 1. Purpose

A.   The purpose of these requirements is to define the minimum valuation standard under a principles-based approach for individual life products defined in [insert applicable section] of the Valuation Manual.

B.   The method for calculating reserves defined in ~~this regulation~~these requirements shall constitute the Commissioner's Reserve Valuation Method (CRVM) for policies to which ~~this regulation~~these requirements are ~~is~~ applicable.

~~B.   The purpose of this regulation is to define the minimum valuation standard under a principles based approach for the individual life products listed in Section 3.~~

~~C.   A principles-based approach is one that:~~

~~(1)   Captures all of the material risks, benefits and guarantees associated with the contracts including material tail risk and the funding of the risks.~~

~~(2)   Utilizes risk analysis and risk management techniques to quantify the risks and is guided by the evolving practice and expanding knowledge in the measurement and management of risk. This may include, to the extent required by an appropriate assessment of the underlying risks, stochastic models or other means of analysis that properly reflect the risks of the underlying contracts.~~

2

(3)   Incorporates assumptions and methods that are consistent with, but not necessarily identical to, those utilized within the company's overall risk assessment process. Company risk assessment processes include but are not limited to experience analysis, asset adequacy testing, GAAP valuation and pricing.

(4)   Permits the use of company experience, based on the availability of relevant company experience and its degree of credibility, to establish assumptions for risks over which the company has some degree of control or influence.

(5)   Provides for the use of assumptions, set on a prudent best estimate basis, that contain an appropriate level of conservatism when viewed in the aggregate and that, together with the methods utilized, recognizes the solvency objective of statutory reserve reporting.

Section 2.   **Authority**

This regulation is issued under the authority of Section [insert applicable section] of the Insurance Laws of [insert state]

Drafting Note: This regulation presumes that changes to the Standard Valuation Law have been adopted that permit the use of the principles-based valuation standard defined by this regulation.

Section 3.   **Scope**

A.   This regulation applies to all individual life insurance policies (except those listed in Subsection B below) whether directly written or assumed through reinsurance, including, but not limited to:

(1)   Universal life insurance policies;

(2)   Variable life and variable universal life insurance policies;

(3)   Term life insurance policies;

(4)   Traditional whole life insurance policies;

(5)   Indexed life and indexed universal life insurance policies;

(6)   Individual life policies and individually underwritten certificates issued under a group life insurance contract; and

(7)   Combination policies that include other benefits such as annuity benefits or long term care benefits in addition to life insurance benefits, but are filed as individual life insurance policies.

B.   Life insurance policies not covered by this regulation include:

(1)   Credit life policies;

(2)   Industrial life policies;

(3)   Pre-need policies;

(4)   Final expense policies;

(5)   Group life (except individual policies or individually underwritten certificates issued under a group life insurance contract).

However, a company may make an irrevocable election to include all polices under one or more of the product categories listed in Section 3B that are issued after a specified date. Such election shall be communicated to the commissioner and included in the actuarial report.

C~C~. Reserves for policies, supplemental benefits and riders on these policies that are not directly identified in these requirements ~this regulation~ are to be determined on a basis that is consistent with the principles and methodologies defined in th~is regulation~ese requirements.

~Subs~Section 2~4~. Guiding Principles

The ~method~ methodology defined by ~this regulation~these requirements is based on the following set of principles. These principles sh~ould~all be considered in their entirety, and ~be~ shall be followed when applying the methodology defined by ~this regulation~these requirements and analyzing the resulting reserves.

A. Principle 1: The reserve is based on a prospective valuation method that appropriately captures ~all~ material risks underlying the policies ~product~ being valued and the assets supporting those policies including the product benefits and guarantees, the impact ~magnitude~ of material tail risk, the revenue to fund the risks, and the effect of any risk mitigation techniques.

B. Principle 2: All Risk Factors explicitly or implicitly included in the company's risk assessment and evaluation processes shall be reflected in the methodology defined by these requirements unless:

1) The Risk Factor is not included in the scope of risks defined by principle 1 above (if the risk is excluded on the grounds of materiality under principle 1, then the rationale for exclusion must be documented), or

2) The actuary provides the rationale and supporting documentation for excluding the Risk Factor.

Company risk assessment and evaluation processes include, but are not limited, to economic value valuations, internal capital allocation models, experience analysis, asset adequacy testing, GAAP valuation and pricing.

processes include, but are not limited, to

C.   Principle 3: A deterministic reserve approach may be sufficient for certain products, depending on the nature of the risks, and a stochastic approach may be necessary for other products.

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C.   Principle 43: For risks that the company has some degree of control over (e.g., mortality), assumptions should reflect a blend of company experience and prescribed assumptions (or methods for setting the assumptions), with the relative weightings of each dependent on the credibility of company experience. For risks that the company has no control over (e.g., market interest rate movements), prescribed assumptions or methods for setting the assumption should be used.

ED.   Principle 54: Assumptions that are not stochastically modeled should incorporate appropriate marginMargins for uncertainty. The choice of an appropriate Margin for each assumption may result in a distorted measure of the total risk. Conceptually, the choice of Margins should be made so that the final result approximates what would be obtained for the Reported Reserve at the required CTE level if it were possible to calculate results over the joint distribution of all future outcomes. In applying this concept to the actual calculation of the Reported Reserve, the actuary should be guided by evolving practice and expanding knowledge base in the measurement and management of risk.

FE.   Principle 65: Assumptions are not locked in at issue, but are updated as expectations of future experience and economic conditions change.

GF.   Principle 76: While a stochastic cash flow model attempts to include all real world risks relevant to the objective of the stochastic cash flow model and relationships among the risks, it will still contain limitations because it is only a model. Neither Aa cash flow scenario model , nor a method based on factors calibrated to the results of a cash flow scenario model, cannot completely quantify a company's exposure to risk. A model attempts to represent reality, but will always remain an approximation thereto and hence uncertainty in future experience is an important consideration when determining the stochastic reserveStochastic Reserve amount. As such:

(1)   The actuary shall take the regulation's limitations of the cash flow model into consideration when setting assumptions, applying the methodology defined by these requirements and determining the appropriateness of the resulting reserve levels.

(2)   The use of assumptions and risk management strategies should be appropriate to the business and not merely constructed to exploit "foreknowledge" of the components of the required methodology. Therefore, the use of assumptions, methods, models, risk management strategies (e.g., hedging), other Dderivative Programsinstruments, structured investments or any other risk transfer arrangements (such as reinsurance) that serve to materially reduce the calculated statutory reserve without also reducing risk on scenarios similar to those used in the actual cash flow modeling are inconsistent with these principles.

SubsSection 35. Definitions

The following terms shall have the indicated meanings for purposes of this regulationthese requirements:

A.   "Accumulated Ddeficiency", when capitalized, means an amount measured as of the projection start dateProjection Start Date and as of the end of each projection yearProjection Year used in the calculation of the scenario reserveScenario Reserve.

B.   "Actuarial Rreport", when capitalized, means a document prepared by the actuary that summarizes all of the material decisions supporting the calculation of the reported reserveReported Reserve, including assumptions, marginMargins and methodologies used to calculate the reported reserveReported Reserve

C~~DC~~. "Aggregate ~~D~~deterministic ~~S~~scenario ~~R~~reserve", when capitalized, means an amount used to support the stochastic modeling exclusion for a group of policies.

D~~ED~~. "Asset ~~S~~segment", when capitalized, means a group of assets associated with a group of policies that are modeled together to determine the path of ~~net asset earned rate~~Net Asset Earned Rates. This grouping will generally follow the company's ~~asset segment~~Asset Segmentation plan, investment strategies, or approach used to allocate investment income for statutory purposes.

E~~FE~~. "~~Best estimate~~Anticipated Experience ~~A~~assumptions", when capitalized, means the actuary's expectation of future experience for a risk factor given available, relevant information pertaining to the assumption being estimated and set in such a manner that it is reasonable to expect that the actual value of the risk factor is as likely to be greater than the assumed value as less that the assumed value.

F~~GF~~. "Cash ~~F~~flow ~~M~~model", when capitalized, means a model that projects asset and liability cash flows used to determine a path of ~~N~~net ~~A~~asset ~~E~~earned ~~R~~rates and the net cash flows and statement value of assets for the ~~D~~deterministic ~~R~~reserve and ~~S~~stochastic ~~R~~reserve.

G~~HG~~. "Cash ~~S~~surrender ~~V~~value", when capitalized, means the amount available to the policyholder upon surrender of the ~~policy~~Policy, prior to any outstanding policy indebtedness.

H~~IH~~. "Clearly ~~D~~defined ~~H~~hedging ~~S~~strategy", when capitalized, means a Derivative Program~~strategy undertaken by~~ of the ~~a~~ company established to ~~hedge~~manage risks through the future purchase or sale or opening and closing of Derivative~~hedging~~ Iinstruments and ~~the opening and closing of hedging positions~~ that meet~~sing~~ the principles outlined in ~~Sub~~Section 2~~4~~ of ~~this regulation~~this Section (particularly Principle 7~~6~~) and the requirements of a ~~C~~clearly ~~D~~defined ~~H~~hedging ~~S~~strategy as described in ~~Sub~~Section 5~~7~~E(9).

I~~JI~~. "Conditional ~~T~~tail ~~E~~expectation (CTE)" means a statistical risk measure that is calculated as the average of all modeled outcomes (ranked from lowest to highest) at percentiles above the percentile corresponding to the CTE level. The CTE measure provides enhanced information about the tail of a distribution compared to that provided by the order statistics (percentiles). For example, CTE 65 averages all modeled outcomes at percentiles above the 65th percentile.

J~~KJ~~. "Derivative Asset Program", when capitalized, means a Derivative Program for which the Derivative Instrument cash flows are combined with asset cash flows within the Cash Flow Model.

K~~LK~~. "Derivative Instrument", when capitalized, means a Derivative Instrument is an option, cap, floor, warrant, swap, forward or future, or a combination of two or more such instruments. Each Derivative Instrument shall be viewed as part of a specific Derivative Program.

L~~M~~. "Derivative Liability Program", when capitalized, means a Derivative Program for which the Derivative Instrument cash flows are combined with liability cash flows within the Cash Flow Model.

M~~N~~. . "Derivative Program", when capitalized, means a program to buy or sell or open or close one or more Derivative Instruments to achieve a specific objective that has been defined or approved by the company's Board of Directors or a subcommittee thereof. Both hedging and non-hedging programs (e.g. for replication or income generation objectives) are included in this definition. Each Derivative Program shall either be treated as a Derivative Asset Program or as a Derivative Liability Program, as deemed more appropriate by the actuary, where such treatment shall not change from one year to the next except under special circumstances disclosed by the actuary.

N~~O~~. "Deterministic ~~R~~reserve", when capitalized, means the amount ~~a reserve~~ determined on a seriatim basis using a single scenario and a set of prescribed and P~~prudent best estimate~~rudent Estimate ~~A~~assumptions. ~~It equals the sum of the greater of the seriatim reserve and the cash surrender value for each policy.~~

6

O~~PK~~. "Discount R~~r~~ates", when capitalized, means the path of pre-tax interest rates used to discount cash flows for the D~~d~~eterministic R~~r~~eserve and the A~~a~~ccumulated D~~d~~eficiencies for the S~~s~~tochastic R~~r~~eserve calculations.

P~~QL~~. "Fraternal B~~b~~enefits", when capitalized, means payments made by a fraternal life insurance company for charitable purposes that are consistent with and/or support the fraternal purposes of the company.

Q~~RM~~. "Gross W~~w~~ealth R~~r~~atio", when capitalized, means the cumulative equity index return for the indicated time period and percentile (e.g., 1.0 indicates that the index is at its original level).

~~N. "Independent reviewer" means~~

Drafting Note: ~~Definition for independent reviewer to be provided by the NAIC Life and Health Actuarial Task Force SVL2 Subgroup.~~

R~~SO~~. "Margin", when capitalized, means an amount applied to a~~n~~ A~~best estimate~~nticipated Experience A~~a~~ssumption in order to derive a P~~prudent best estimate~~rudent Estimate A~~a~~ssumption to provide for estimation error and adverse deviation. The M~~m~~argin should be directly related to the level of uncertainty in the risk factor for which the P~~prudent best estimate~~rudent Estimate A~~a~~ssumption is made, whereby the greater the uncertainty, the larger the required M~~m~~argin, with the M~~m~~argin added or subtracted as needed to produce a larger Reported R~~r~~eserve than would otherwise result without it.

S~~TS~~.P. "Margin R~~r~~atio", when capitalized, means the ratio of the aggregate ~~margin~~Margin for an A~~a~~sset S~~s~~egment to the discounted value of the capital requirement for the policies in the A~~a~~sset S~~s~~egment, calculated in accordance with Subs~~S~~ection 5~~7~~B(6) ~~of this regulation~~.

T~~UQ~~. "Material T~~t~~ail R~~r~~isk", when capitalized, arises when the S~~s~~cenario R~~r~~eserve for one or more S~~s~~cenarios is significantly higher than the S~~s~~cenario R~~r~~eserves for the rest of the S~~s~~cenarios.

U~~VR~~. "Modified Deterministic Reserve", when capitalized, means the amount used as a replacement for the portion of the Stochastic Reserve for those policies which are subject to the stochastic modeling exclusion.

V~~W~~. "Net A~~a~~sset E~~e~~arned R~~r~~ates", when capitalized, means the path of earned rates reflecting the net general account portfolio rate in each P~~p~~rojection I~~i~~nterval (net of appropriate default costs and investment expenses). This set of rates   is one factor used to determine the amount of benefits, expenses and revenue that depend on the level of interest credited.

W~~XS~~. "Net I~~i~~nvestment E~~e~~arnings", when capitalized, means the amount used to determine the N~~n~~et A~~a~~sset E~~e~~arned R~~r~~ate for each P~~p~~rojection I~~i~~nterval as defined in Subs~~S~~ection 5~~7~~F(2).

X~~YT~~. "Non-guaranteed E~~e~~lements (NGE)", when capitalized, means debits or credits to a policyholder's account value, benefit, premiums, or consideration that may be adjusted at the discretion of an insurance company. For purpose of ~~this regulation~~these requirements, N~~n~~on-guaranteed E~~e~~lements includes policyholder dividends for participating policies and participation rates and asset fee charges for equity indexed universal life policies.

Y~~ZU~~. "Non-guaranteed E~~e~~lement (NGE) S~~s~~pread", when capitalized, means the provision that a company uses to adjust actual experience to determine each N~~n~~on-guaranteed E~~e~~lement. The NGE spread can be positive or negative. For example, if a company credits interest to policyholders at a rate 1.20% lower than its net investment yield, then the NGE spread is a negative 120 basis points.

Z~~AAV~~. "Notional G~~g~~ross R~~r~~eserve", when capitalized, means the ~~amount of the~~ R~~r~~eported R~~r~~eserve that would have been held in the absence of any ceded reinsurance.

AA~~ABBAW~~. "Per P~~p~~olicy R~~r~~eserve", when capitalized, means an amount determined for each ~~policy~~Policy that equals the greater of the C~~c~~ash S~~s~~urrender V~~v~~alue and the S~~s~~eriatim R~~r~~eserve.

BB~~X~~. "Policy", when capitalized, means a life insurance policy included in the scope of ~~this regulation~~these requirements.

CCY. "Projection Iinterval", when capitalized, means the time interval used in the Ceash Fflow Mmodel to project the cash flows amounts (e.g. monthly, quarterly, annually).

DDZ. "Projection Pperiod", when capitalized, means the period over which the Ceash Fflow Mmodel is run to produce the Sstochastic and Ddeterministic Rreserves.

EEAA. "Projection Sstart Ddate", when capitalized, means the date on which the Pprojection Pperiod begins.

FFBB. "Projection Yyear", when capitalized, means a 12-month period starting on the Pprojection Sstart Ddate or an anniversary of the Pprojection Sstart Ddate.

GGCC. "Proprietary Sscenario Ssets", when capitalized, means a small number of prescribed paths of interest rate and equity performance that are not necessarily a representative sample of a larger set of stochastic paths, but a conservative sample developed by the company for the purpose of calculating the Sstochastic Rreserve on a conservative basisfor policies within the scope of this regulation.

HHDD. "Provision for Model Understatement", when capitalized, means the actuary's estimate of the understatement in the modeling results due to the aggregate impact of material approximations, simplifying assumptions or simplified techniques used in the Cash Flow Model.

II. "Prudent best estimatePrudent Estimate Aassumption", when capitalized, means a deterministic assumption, used to represent a Rrisk Ffactor developed by applying a Mmargin to the Abest estimatenticipated Experience Aassumption for that Rrisk Ffactor.

JJEE. "Qualified actuary", when capitalized, means an actuary who meets the qualifications in SubsSection 46E to certify that the reserves for the policies subject to this regulationthese requirements have been calculated following all applicable laws, regulations, actuarial guidelines and Actuarial Standards of Practice. The qualified actuary shall be referred to throughout this regulationthese requirements as "the actuary."

KKFF. "Recalculated deterministic reserve" means the amount used as a replacement for the stochastic reserve for those policies that are subject to the stochastic modeling exclusion.

GG. "Reported Rreserve", when capitalized, means the minimum reserve requirement as of the valuation date for the policies falling within the scope of this regulationthis Section using a principles-based approach and equals the greater of the deterministic reserve and the stochastic reserve, as defined by this regulation.

LLHH. "Revenue Ssharing", when capitalized, means any arrangement or understanding by which an entity responsible for providing investment or other types of services makes payments to the company (or to one of its affiliates). Such payments are typically in exchange for administrative services provided by the company (or its affiliate), such as marketing, distribution and record keeping. Only payments that are attributable to charges or fees taken from the underlying variable funds or mutual funds supporting the policies that fall under the scope of this regulationthese requirements shall be included in the definition of revenue sharing.

MMII. "Risk Ffactor", when capitalized, means an aspect of future experience that is not fully predictable on the Vvaluation Ddate and that can affect the future financial results arising from the provisions of a Ppolicy.

NNJJ. "Scenario", when capitalized, means a single path of outcomes used in the a Ceash Fflow Mmodel, such as a path of future interest rates, equity performance, and separate account fund performance. It could also include outcomes related to policyholder behavior (e.g., lapses) and company experience (e.g., mortality).

OOKK. "Scenario Rreserve", when capitalized, meansequals the amount determined in SubsSection 57H(4)(a) for all policies on an aggregated basis for a given Sscenario that is used as a step in the calculation of the Sstochastic Rreserve.

PPLL. "Seriatim Rreserve", when capitalized, meansequals the amount determined in SubsSection 57G(3)(b) for a given Ppolicy that is used as a step in the calculation of the Deterministic Rstochastic reserve.

QQMM. "Standalone Stochastic Reserve", when capitalized, means an amount used in the stochastic model exclusion that equals the CTE amount on the group of polices that are subject to the stochastic modeling exclusion.

RR. "Starting Aasset", when capitalized, means the assets assigned to an Aasset Ssegment prior to the calculation of the Rreported Rreserve, and valued as of the Pprojection Sstart Ddate.

SSNN. "Stochastic Rreserve", when capitalized, means provides for all material risks of a group of policies, including material tail risk arising from sensitivities to changing economic conditions. It equals the amount determined by applying a prescribed CTE level to the distribution of Sscenario Rreserves over a broad range of stochastically generated scenarioScenarios and using Pprudent best estimaterudent Estimate Aassumptions for all assumptions not stochastically modeled, plus the Modified Deterministic Reserve for those policies subject to the stochastic modeling exclusion. The prescribed CTE level is established by the NAIC.

Drafting Note: The prescribed CTE level is expected to be set by the NAIC.

TTOO. "Valuation Ddate", when capitalized, means the date for which the Rreported Rreserve is to be valued as required by the Standard Valuation Law.

SubsSection 46. Certification and Documentation Requirements

Drafting Note: This regulation presumes that requirements have been adopted to define the regulatory and governance process.

A. A qualified actuary shall provide a certification that the reported reserveReported Reserve was calculated in a manner that meets the requirements of this regulationthis Section and complies with all applicable Actuarial Standards of Practice. This certification should identify the items on which the Qualified Actuary is providing information, and a statement as to the accuracy, completeness or reasonableness, as applicable, of the items. This certification shall include the signature, title, company, address and telephone number of the person rendering the certification, as well as the date on which it is signed.

B. The actuary shall prepare an actuarial reportActuarial Report each year that documents all material decisions made, and information used, to support the certification including assumptions, marginMargins and methodologies used to calculate the reported reserveReported Reserve.

(1) The actuarial reportActuarial Report shall include:

(a) A description of the blocks of policies subject to these requirements model regulation;

(b) A description of the starting assetsStarting Assets supporting the block of policies subject to these requirements model regulation, and a description of the reinvestment and disinvestment strategy used to acquire or sell assets after the Pprojection Start Ddate;

(ce) A comparison of the deterministic reserveDeterministic Reserve to the stochastic reserveStochastic Reserve, including the distribution of the scenario reserveScenario Reserves;

(dd) Documentation of the key modeling decisions made by the actuary, including:

A description of the valuation assumptions, methods, models, risk management strategies (e.g., hedging), derivative instrumentsother Derivative Programs, structured investments or any other risk transfer arrangements (such as reinsurance);

(e)

9

(ii) Results of applicable sensitivity tests;

(f) All of the items required by ~~this Guideline.~~Subsection 13 of this Section.

(g) ~~and~~

(iii) Disclosure of all other items required by ~~this regulation~~this Section~~,~~, including but not limited to: the impact of aggregation, the impact of ~~margin~~Margins on the ~~reported reserve~~Reported Reserve and a demonstration of the stochastic modeling exclusion (if elected)~~.~~;

~~~~(he) A list of key risk and experience reporting elements that the company will be tracking ~~A list of the key risk measurement tracking tools that the company uses to track a~~to ~~nd~~ assess the impact of changes in experience between ~~valuation date~~Valuation Dates~~.~~, the frequency of that tracking and a documentation of past management actions taken because of that tracking; and

(i) Additional analytics as required by the NAIC or Actuarial Standards of Practice

(2) The ~~Report~~Actuarial Report shall include any material considerations that the actuary considers necessary to understand the development of ~~mortality~~ assumptions for the statutory reserve valuation even if such considerations are not explicitly required ~~by~~in this Section. The documentation should be explicit when material judgments were required and such judgments had to be made without supporting historical experience.

(32) The ~~A~~actuarial ~~R~~report shall be provided to the PBA Review Actuary ~~an independent reviewer~~ who shall provide an opinion to the commissioner on whether the company prepared proper documentation, made proper disclosures, and complied with ~~this regulation~~the requirements of this Section.

Drafting Note: The timing of when the report is provided will be determined by the NAIC. ~~Details regarding the role and responsibilities of the independent reviewer will be defined by the NAIC.~~

(43) The ~~actuarial report~~Actuarial Report and any other material provided by the company to the commissioner or the PBA Review Actuary~~an independent reviewer~~ in connection therewith, shall be kept confidential by the commissioner and the PBA Review Actuary~~independent reviewer~~ and shall not be made public. The ~~actuarial report~~Actuarial Report or other material may otherwise be released by the commissioner (a) with the written consent of the company, or (b) to the ~~American Academy of Actuaries~~Actuarial Board for Counseling and Discipline upon request stating that the report of other material is required for the purpose of professional disciplinary proceeding and setting forth procedures satisfactory to the commissioner for preserving the confidentiality of the ~~actuarial report~~Actuarial Report or other material.

Drafting Note: Record retention requirements are needed if not included in the law.

C. ~~This regulation~~These requirements require~~s~~ the actuary to make various determinations, verifications and a certification. The company shall provide the actuary with the necessary information sufficient to permit the actuary to fulfill the responsibilities set forth in ~~this regulation~~these requirements and responsibilities arising from applicable Actuarial Standards of Practice.

D. Except in cases of fraud or willful misconduct, the qualified actuary shall not be liable for damages to any person (other than the insurance company and the commissioner) for any act, error, omission, decision or conduct with respect to the actuary's opinion.

E. A qualified actuary shall:

(1) Be a member of the American Academy of Actuaries;

(2)   Be familiar with all appropriate standards of practice that apply to principles-based reserves;

(3)   Not have been found by the commissioner, following appropriate notice and hearing to have:

(a)   Violated any provision of, or any obligation imposed by, the insurance law or other law in the course of his or her dealings as a qualified actuary, a PBA Review Actuaryn independent reviewer or an appointed actuary;

(b)   Guilty of fraudulent or dishonest practices;

(c)   Demonstrated his or her incompetence, lack of cooperation, or untrustworthiness to act as an qualified actuary; or

(d)   Resigned or been removed as a qualified actuary within the past five (5) years as a result of acts or omissions indicated in any adverse report on examination or as a result of a failure to adhere to generally acceptable actuarial standards or for the other reasons enumerated in this SubsSection 46(E)(3);

(4)   Failed to notify the commissioner of any action taken by a commissioner of another state similar to that under Paragraph (3) above.

Drafting Note: It needs to be determined whether the qualified actuary must be appointed by, or be delegated authority by, the Board of Directors of the company. This will depend on the requirements of the regulatory and governance process being established in other regulations and guidelines.

SubsSection 57. Definition of General Reserve Methodology

A.   Summary.

(1)   This regulationThese requirements applyies the principles of risk management, asset adequacy analysis and stochastic modeling to establish the minimum reserve for the products within its scope. For some products, using only a deterministic, single scenario approach may be adequate to capture the risks of the policyPolicy. For products with material tail risk, a stochastic modeling approach is required (although an exception to this requirement may be made if certain conditions are met, as described in SubsSection 57H(5) below. However, the stochastic modeling approach does not require that all assumptions be stochastically modeled.

(2)   TThis regulation requires that the reported reserveReported Reserve for policies falling within the its scope of this section equals the be based on the greater of an amount calculated using a seriatim, deterministic method (deterministic reserveDeterministic Reserve) and an amount calculated using a stochastic method when appropriate (stochastic reserveStochastic Reserve), where the comparison is done on an aggregate basisplus a Provision for Model Understatement that reflects the actuary's estimate of any understatement in the modeling results arising from material approximations, simplifying assumptions or simplified techniques used in the Cash Flow Model. - Both the deterministic reserveDeterministic Reserve and the stochastic reserveStochastic Reserve shall be determined by projecting net cash flows as described below.

(3)   The actuary may elect to perform the reserve calculations as defined required by this regulationthese requirements on a date other than the valuation dateValuation Date, but in no event earlier than six months before the valuation dateValuation Date, as long as an appropriate method is used to adjust the reserve so determined to the valuation dateValuation Date. Disclosure of the results of such adjustment and the methodology used to determine the adjustment is required.

(4)   The deterministic reserveDeterministic Reserve is calculated using a seriatim approach and prudent best estimate assumptionPrudent Estimate Assumptions over a single scenarioScenario.

(5)   The stochastic reserveStochastic Reserve is calculated in the aggregate using a projection of net cash flows over a broad range of stochastically generated scenarioScenarios, using prudent best

11

estimate assumptionPrudent Estimate Assumptions for all assumptions not stochastically modeled, and then applying a prescribed CTE level. A company may elect to exclude certain policies from the stochastic modeling requirement if certain conditions are met (as described in SubsSection 57H(5)).

B. ~~Prudent Best Estimate Assumption~~Prudent Estimate Assumptions.

(1) The actuary shall determine ~~prudent best estimate assumption~~Prudent Estimate Assumptions for each risk factor that is not prescribed or is not stochastically modeled. The ~~prudent best estimate assumption~~Prudent Estimate Assumptions shall vary from ~~scenario~~Scenario to ~~scenario~~Scenario as appropriate. A ~~prudent best estimate assumption~~Prudent Estimate Assumption is developed by applying a ~~margin~~Margin to ~~the a best estimate assumption~~Anticipated Experience Assumption for the risk factor. The ~~prudent best estimate assumption~~Prudent Estimate Assumption for each risk factor shall be:

(a) Consistent with the principles stated in SubsSection 24 of ~~this regulation~~these requirements;

(b) Based on any relevant and credible experience that is available, including, but not limited to, the company's own experience studies and industry experience studies;

(c) Set to produce, together with other ~~prudent best estimate assumption~~Prudent Estimate Assumptions, an overall value for the ~~reported reserve~~Reported Reserve that is consistent with the objectives of statutory reserve reporting; and

(d) Supported by a documented process to reassess the appropriateness of the assumption in future valuations.

(2)(2) Prescribed ~~Deterministic Reserve~~Deterministic Reserve ~~Valuation~~ assumptions include:

(a). Interest Rate movements (i.e., Treasury interest rate curves);
(b). Net Spreads (net of default costs and investment expenses) over Treasuries for Reinvestment Assets;
(c). Equity performance (i.e., S&P 500 returns and other returns of other equity investments).

(3). ~~Stochastic Reserve~~Stochastic Reserve ~~Valuation~~ Assumptions.

(a)1. Unless stated otherwise, Prudent ~~Best~~ Estimate Assumptions used in the ~~Stochastic Reserve~~Stochastic Reserve shall be the same as those used in the ~~Deterministic Reserve~~Deterministic Reserve.

(b)2. Prescribed assumptions include net spreads (net of default costs and investment expenses) over Treasuries for reinvestment Assets.

(c)3. Risk Factors that are required ~~by the Model Regulation~~ to be modeled stochastically are:

a. Interest Rate movements (i.e., Treasury interest rate curves)
b. Equity performance (i.e., S&P 500 returns and returns of other equity investments).

(d)4. The actuary may elect to stochastically model other Risk Factors in addition to the Risk Factors listed in (c)3 above. If so elected, the requirements in ~~the Guideline~~ this Section for determining Prudent ~~Best~~ Estimates for the Risk Factor would not apply.

(4). Granularity Considerations.

(a). In establishing valuation assumptions, the actuary shall choose between setting a separate assumption specific and appropriate to each individual ~~policy~~Policy being valued, a

12

single assumption to be applied to all Ppolicies being valued, or an assumption with some degree of granularity within these two endpoints. In making that choice, the actuary shall balance the volume of work in establishing a separate assumption specific and appropriate to each individual policyPolicy against the possible loss of precision and appropriateness in applying an assumption over a broader group of policies. For example, the application of a single assumption for premium payment patterns over a group of policies may lead to the unintended premature cessation of projected benefits.

(b). The actuary shall estimate and disclose the effect of the choice of granularity in the Actuarial ReportActuarial Report. The appropriate degree of granularity in the assumptions will be determined by the sensitivity of the results to different levels of granularity. Assessing the acceptability of the level of granularity and estimating the effect of a less granular model may be performed on a date other than the Projection Start DateProjection Start Date, and need not be updated every year, unless the actuary determines that such an update is appropriate.

Drafting Note: Further guidance on assessing the acceptability of the level of granularity may be provided by an ASOP, subject to approval by the ASB.

(5) Best Estimate AssumptionAnticipated Experience Assumptions. The actuary shall use company experience, if relevant and credible, to establish an best estimate assumptionAnticipated Experience Assumption for any risk factor. To the extent that company experience is not available or credible, the actuary may use industry experience or other data to establish the best estimate assumptionAnticipated Experience Assumption, making modifications as needed to reflect the actuary's expectation of the risk.

(63) Aggregate MarginMargin. Consistent with the definition of a principles-based approach in SubSsection 1C(5), marginMargins shall be determined in a manner that when taken in the aggregate, the impact on the reported reserveReported Reserve produces an appropriate and reasonable level of conservatism that is consistent with the objectives of statutory reporting.

Drafting Note: Further wording will be added to these requirements to address concerns on how the requirement above for the aggregate Margin will impact the determination of Margins on each Risk Factor. The American Academy of Actuaries' Life Reserves Work Group and other principles-based reserve groups need the NAIC's Life and Health Actuarial Task Force's input on how to define when the reported reserveReported Reserve produces an appropriate and reasonable level of conservatism consistent with the objectives of statutory reporting. By doing so, the regulator, PBA Review Actuary peer reviewer and actuary are then able to reach conclusions regarding the appropriateness of marginMargins on each Risk Factor.

(74) MarginMargin for each Risk Factor. The actuary shall provide for adverse deviations and estimation error in each risk factor. When determining the marginMargin for each risk factor, the actuary shall be guided by the following principles:

(a) The greater the uncertainty in the best estimate assumptionAnticipated Experience Assumption, the larger the required marginMargin, with the marginMargin added or subtracted as needed to produce a larger reserve than would otherwise result without it;

(b) The actuary shall examine the sensitivity of the reported reserveReported Reserve to changes in the assumptions for the risk factor. Greater analysis and justification is needed to establish the marginMargin when the impact of alternate assumptions is material, such as increased disclosure to the regulator and more frequent monitoring of emerging experience;

(c) MarginMargins do not need to be established for risk factors where alternate assumptions do not have a material impact on the reported reserveReported Reserve;

(d) The magnitude of fluctuations in historical experience of the company for the risk factor shall be included in the analysis of determining the marginMargin. When available and appropriate, the actuary may elect to express such fluctuations using the standard deviation around the mean or other standard statistical measures.

(e)   The ~~margin~~Margin does not need to take into account the possibility of catastrophic events which are implausible in usual operations.

(f)   The ~~margin~~Margin shall satisfy any further conditions set forth by ~~this regulation~~these requirements or any supporting actuarial guidelines and applicable Actuarial Standards of Practice with respect to ~~margin~~Margins or ~~prudent best estimate assumption~~Prudent Estimate Assumptions for the risk factor.

(g)   Unless there are clear reasons to expect otherwise, a higher ~~margin~~Margin shall be established when:

    (i)   Experience data are lacking or limited as compared to the case if abundant and relevant experience data are available;

    (ii)   There is doubt about the reliability of the ~~best estimate assumption~~Anticipated Experience Assumption, such as, but not limited to recent changes in circumstances, or changes in company policies;

    (iii)   An approximation with less precision is being used;

    (iv)   The experience is not relevant and credible and the event assumed is further in the future; or

    (v)   There are contingencies related to policyholder behavior in situations where a given policyholder action results in the surrender or exercise of a valuable option.

(8~~5~~)   Impact of each Margin

(a)   The actuary shall determine and disclose in the ~~A~~actuarial ~~R~~report an estimate of the impact of each ~~margin~~Margin on the ~~D~~deterministic ~~R~~reserve for the following ~~R~~risk ~~F~~factors: mortality, policyholder behavior, expense and asset return assumptions. This shall be determined for each ~~A~~asset ~~S~~segment by:

    (i)   Calculating the sum of ~~S~~seriatim ~~R~~reserves based on the ~~A~~~~best estimate~~nticipated Experience ~~A~~assumption for the ~~R~~risk ~~F~~factor and ~~P~~prudent ~~best estimate~~rudent Estimate Assumptions for all other ~~R~~risk ~~F~~factors; and

    (ii)   Subtracting the value determined in Paragraph 8~~5~~(a)(i) above from the sum of ~~S~~seriatim ~~R~~reserves as reported.

(b)   Since the actuary does not determine a~~n~~ ~~A~~~~best estimate~~nticipated Experience ~~A~~assumption or a ~~P~~~~prudent best estimate~~rudent Estimate ~~A~~assumption for assumptions that are prescribed (e.g. interest rates movements, equity performance and net spreads on reinvestment assets), the prescribed assumption shall be deemed to be the ~~P~~~~prudent best estimate~~rudent Estimate ~~A~~assumption, and the equivalent of a~~n~~ "~~A~~~~best estimate~~nticipated Experience Assumption" ~~assumption~~ for each of these ~~R~~risk ~~F~~factors will be prescribed ~~by the NAIC~~ for the purpose of determining the impact of each ~~M~~margin as required by this Section.

(9~~6~~)   Impact of Aggregate Margin

(a)   The actuary shall determine and disclose in the ~~A~~actuarial ~~R~~report an estimate of the aggregate impact of the all ~~M~~margin on the Deterministic Reserve for each ~~A~~asset ~~S~~segment by:

14

(i)   Calculating the sum of ~~Ss~~eriatim ~~Rr~~eserves based on ~~Abest estimate~~nticipated Experience ~~Aa~~ssumptions, prior to the addition of any ~~Mm~~argins; and

(ii)   Subtracting the value determined in Paragraph ~~9~~6(a)(i) above from the sum of ~~Ss~~eriatim ~~Rr~~eserves as reported.

(b)   Since the actuary does not determine a~~n~~ ~~Abest estimate~~nticipated Experience ~~Aa~~ssumption or a ~~Pprudent best estimate~~rudent Estimate ~~Aa~~ssumption for assumptions that are prescribed (e.g. interest rates movements, equity performance, and net spreads on reinvestment assets), the prescribed assumption shall be deemed to be the ~~Pprudent best estimate~~rudent Estimate ~~Aa~~ssumption, and the equivalent of a~~n~~ "~~Abest estimate~~nticipated Experience" ~~Aa~~ssumption for these ~~Rr~~isk ~~Ff~~actors will be prescribed ~~by the NAIC~~ for the purpose of determining the aggregate impact of all ~~Mm~~argins as required by this Section.

(10~~7~~)   The actuary shall determine and disclose in the ~~Aa~~ctuarial ~~Rr~~eport an estimate of the ~~Mm~~argin ~~Rr~~atio for each ~~Aa~~sset ~~Ss~~egment by:

(a)   Determining the dollar amount of the aggregate Margin in the Reported Reserve by subtracting (ii) from (i):

(i)   The Reported Reserve

(ii)   The Deterministic Reserve that would result from assuming all Margins are zero.

(b)   Estimating the aggregate risk-based capital requirement on the Projection Start Date and at the end of each Projection Year for the Policies in the Asset Segment. The estimate of the aggregate risk-based capital requirement shall be an estimate of the total risk-based capital at the company action level for the Policies in each Asset Segment, based on the annual statement instructions for the year in which the Valuation Date falls. The actuary may base estimates for future years on the assumption that functional relationships from which the current year risk-based capital can be calculated will continue to hold for future years;

Drafting Note: Additional research and analysis is needed to address concerns with how to project the risk-based capital (RBC) requirements, especially in situations where components of the RBC requirements are calculated using a principles-based approach.

(~~c~~b)   Determining the discounted value of the aggregate risk-based capital requirements for the ~~Pp~~olicies in the ~~Aa~~sset ~~Ss~~egment determined in ~~Paragraph~~Subsection (10) ~~7~~(~~b~~a) above, using the ~~Dd~~iscount ~~Rr~~ates for the ~~Aa~~sset ~~Ss~~egment;

(c)   Dividing the aggregate ~~Mm~~argin for the ~~Aa~~sset ~~Ss~~egment determined in Paragraph (10)(a)~~Subsection (6)~~ above by the discounted value of the risk-based capital requirement for the ~~Pp~~olicies in the ~~Aa~~sset ~~Ss~~egment determined in Paragraph (10~~Subsection 7~~(~~c~~b) above.

Drafting Note: The NAIC may want to consider setting a prescribed minimum floor for this ratio.

~~**Drafting Note:** Further guidance on how to calculate the margin ratio may be provided in an actuarial guideline.~~

C.   Cash Flow Models.

(1)   (a)   Purpose. Both the ~~stochastic reserve~~Stochastic Reserve and ~~deterministic reserve~~Deterministic Reserve calculations require the use of ~~cash flow model~~Cash Flow Models for each ~~asset segment~~Asset Segment. The ~~cash flow model~~Cash Flow Models shall:

(i)   Project the premiums, benefits, expenses and other applicable revenue items to be used in the reserve calculations; and

15

      (ii)   Project the total asset and liability cash flows, ~~net investment earnings~~Net Investment Earnings, and invested asset balances for the purpose of determining the path of ~~net asset earned rate~~Net Asset Earned Rates.

    (b)   For ~~deterministic reserve~~Deterministic Reserve, it is permissible to use a grouped liability model to calculate the path of ~~net asset earned rate~~Net Asset Earned Rates and then perform the seriatim reserve calculation on each ~~policy~~Policy based on those ~~net asset earned rate~~Net Asset Earned Rates.

(2)   General Description of Cash Flow Projections. For the ~~deterministic reserve~~Deterministic Reserve and for each ~~scenario~~Scenario for the ~~stochastic reserve~~Stochastic Reserve, a cash flow projection shall be made ignoring federal income taxes and shall reflect the dynamics of the expected cash flows for the entire ~~asset segment~~Asset Segment. The projection shall include the effect of all material product features, both guaranteed and non-guaranteed.

    (a)   Actual gross premiums received from the policyholder shall be included as revenue in the cash flow projection. Amounts charged to account values on general accounts business (such as cost of insurance and expense charges) shall not be included in the cash flow projection as revenue, but shall be projected since they will affect the level of cash surrender benefits.

    (b)   Net cash flows between the general account and separate account for variable products will be included in the cash flow projection. (Cash flows going out from the general account to the separate account increase the reserve, and cash flows coming in to the general account from the separate account decrease the reserve.) Examples include allocation of net premiums to the separate account, policyholder-initiated transfers between fixed and variable investment options, transfers of separate account values to pay death or withdrawal benefits, and amounts charged to separate account values for cost of insurance, expense, etc.

    (c)   Insurance company expenses (including overhead expenses), commissions, fund expenses, contractual fees and charges, revenue sharing income received by the company (net of applicable expenses) and cash flows associated with any reinsurance are to be reflected on a basis consistent with the requirements herein. Expenses paid to provide fraternal benefits in lieu of federal income taxes are excluded.

    (d)   Asset cash flows shall include cash receipts or disbursements associated with investment income, realized capital gains and losses, principal repayments, appropriate asset default costs, investment expenses, ~~income from hedge instruments,~~ asset prepayments, ~~and~~ asset sales, and cash flows from Derivative Asset Programs. Cash flows from Derivative Liability Programs shall be combined with policyholder cash flows for purposes of calculating the Stochastic Reserve and Deterministic Reserve.

    (e)   Throughout the projection, where estimates of asset or liability items are made that are neither stochastically generated nor prescribed, such estimates shall be on a ~~prudent best estimate~~Prudent Estimate basis.

    (f)   Since the projection of cash flows reflect premium mode directly, deferred premiums are zero under this approach.

(3)   Cash flows from ~~starting assets~~Starting Assets. Assets at the beginning of the projection shall be selected from the company's actual assets backing the policies associated with each ~~asset segment~~Asset Segment. The amount of ~~starting assets~~Starting Assets shall be determined as described in ~~Subs~~Section ~~5~~7E(1). Cash flows on general account ~~starting assets~~Starting Assets for each ~~projection interval~~Projection Interval shall be determined as follows:

    (a)   Fixed income investments (e.g., public bonds, convertible bonds, preferred stocks, private placements, asset backed securities, commercial mortgage loans, residential mortgage

loans, mortgage backed securities, and collateralized mortgage obligations) including Derivative Asset Programshedge instruments associated with these assets.

(i) Gross investment income and principal repayments shall be modeled in accordance with the contractual provisions of each asset and in a manner consistent with each scenarioScenario. Grouping of assets is allowed if the actuary can demonstrate that grouping does not result in materially lower reserves than would have been obtained using a seriatim approach.

(ii) Appropriate asset default costs and investment expenses shall be reflected through a deduction to the gross investment income using prudent best estimatePprudent eEstimates.

(iii) Realized capital gains and losses on asset sales shall be modeled in a manner that is consistent with the company's documented investment and disinvestment policyPolicy.

(iv) Any uncertainty in the timing and amounts of asset cash flows related to- the paths of interest rates, equity returns, or other economic values contained in the various scenarioScenarios shall be reflected directly in the projection of asset cash flows under the various scenarioScenarios within the model as defined in SubsSection 57D.

(b) Equity investments (i.e., non-fixed income investments having substantial volatility of returns such as common stocks and real estate investments) including Derivative Programs hedge instruments associated with these assets.

(i) The number of equity investment categories, and the allocation of specific assets to each category (e.g. large cap stocks, international stocks, owned real estate, etc.) shall be determined by the actuary as described in SubsSection 57E(7).

(ii) The gross investment return (including realized and unrealized capital gains) for each investment category shall be projected in a manner that is consistent with the projected total return on the S&P 500 for the scenarioScenario, reflecting any differences in the total return and risk between the S&P 500 and each equity investment category. This does not imply a strict functional relationship between the returns on the various investment categories and the return on the S&P 500, but it would generally be inappropriate to assume that an investment category consistently 'outperforms' (i.e. has lower risk, but achieves a higher expected return relative to the efficient frontier) the S&P 500.

(iii) For the deterministic reserveDeterministic Reserve, the projected S&P 500 total return shall be prescribed as described in SubsSection 57D(1). For the stochastic reserveStochastic Reserve, the projected Standard & Poor's (S&P) 500 return for each scenarioScenario shall be modeled stochastically as described in SubsSection 57D(2).

(iv) The time of sale of the asset shall be modeled in a manner that is consistent with the investment policy of the company for the respective equity investment categories. Investment expenses shall be reflected through a deduction to the gross investment return using prudent best estimate assumptionPrudent Estimate Assumptions.

(c) All other assets. Asset cash flows on other assets that are not described in Subparagraphs (a) and (b) shall be modeled using methods consistent with the methods described in Subparagraphs (a) and (b). This includes assets that are a hybrid of fixed income and equity investments.

(4)   Disclosure of embedded spread on ~~starting assets~~Starting Assets. For fixed income investments included in the ~~starting assets~~Starting Assets (i.e.~~.~~, the asset categories defined in ~~Subs~~Section ~~5~~7C(3)(a), the actuary shall estimate and disclose in the ~~actuarial report~~Actuarial Report the following values for each ~~asset segment~~Asset Segment:

    (a)   The approximate market value and the method used to determine such approximate market value of such investments on the ~~valuation date~~Valuation Date;

    (b)   The statutory value of such investments on the ~~valuation date~~Valuation Date;

    (c)   The gross level "option-adjusted" spread (in basis points) over the Treasury yield curve at the ~~valuation date~~Valuation Date implied in the approximate market values of such investments on that date. Further guidance on acceptable methods to compute this spread shall be published by the NAIC;

    (d)   The projected average estimated annual default costs (including how they were derived) expressed as a percent of the approximate average annual market value of such investments. Further guidance on acceptable methods to compute this spread shall be published by the NAIC;

    (e)   The net level "option-adjusted" spread over the Treasury yield curve at the ~~valuation date~~Valuation Date (Subparagraph (c) minus Subparagraph (d); and

    (f)   The aggregate weighted average life and the method used to determine such aggregate weighted average life of such investments at the ~~valuation date~~Valuation Date.

Drafting Note: This disclosure is intended to provide regulators and the PBA Review Actuary ~~independent reviewers~~ a tool to assess from a capital market perspective the level of asset risk embedded in a company's principles-based valuation compared to that of other companies or compared to the current market risk associated with typical asset classes found in insurance company portfolios. It is anticipated that market spread benchmarks for various asset classes and quality rating levels will be developed or recommended to provide context to regulators and the PBA Review Actuary~~independent reviewers~~ when assessing an individual company's disclosures. It is important to recognize that asset spreads reflect all sources of risk, not just defaults. Further, the existence of these disclosure metrics does not indicate an intent that long-term estimates of default costs should fluctuate significantly from period to period based on movements in market values.

(5)   Cash Flows from Reinvestment Assets. Net cash flows in each ~~projection interval~~Projection Interval shall be reinvested in a manner consistent with the company's investment policy for each ~~asset segment~~Asset Segment. Handling of disinvestment shall be consistent with the company's investment policy and reflect economic reality such as the reasonable short-term borrowing capacity of the company. Cash flows from reinvestment assets shall be determined as described in ~~Subs~~Section ~~5~~7C(3), but with the additional requirement that net spreads (net of default costs and investment expenses) over Treasuries reflected in the purchase yields for such assets shall be prescribed by these requirements. ~~by the NAIC.~~

Drafting Note: The NAIC shall define the nature and level of the prescribed net spreads over Treasuries ~~in an actuarial guideline~~.

(6)   Future Interest Maintenance Reserve (IMR) Amounts. Realized capital gains and losses arising from changes in interest rates can be reflected in the ~~projection interval~~Projection Interval when they occur, or can be spread out over future ~~projection interval~~Projection Intervals by establishing a new IMR amount.

Drafting Note: More discussion is needed as to how principles-based reserves will interact with IMR.

(7)   Length of Projections Period. The ~~projection period~~Projection Period shall be sufficiently long so that no materially greater value of the ~~reported reserve~~Reported Reserve would result from a longer ~~projection period~~Projection Period.

(8)   Simplified Approaches. For the ~~deterministic reserve~~Deterministic Reserve and ~~stochastic reserve~~Stochastic Reserve, simplified approaches may be acceptable if they can be shown to produce reserves that are not materially different than those produced by a more robust ~~cash flow model~~Cash Flow Model.

(9)   Reliance. Asset adequacy analysis principles and techniques as defined by applicable regulations, actuarial guidelines and Actuarial Standards of Practices may be relied on for many of the detailed aspects encountered in projecting cash flows.

D.   Description of Scenarios

(1)   For the ~~deterministic reserve~~Deterministic Reserve, the cash flow projections shall be made in a manner that reflect a single path of U.S. Treasury yield curves, a single path of S&P 500 returns for general account assets, and a single set of paths of future fund performances (for separate account assets). For Treasuries, this path shall start with the current U.S. Treasury rate yield curve in effect at the ~~valuation date~~Valuation Date and grade linearly over time to an ultimate static U.S. Treasury rate yield curve. The length of the grading period and the values of the ultimate yield curve shall be prescribed by the NAIC. The method applicable to determine the single paths of S&P 500 returns and future fund performance shall also be prescribed by these requirements ~~by the NAIC~~.

Drafting Note: It is anticipated that specific parameters associated with the deterministic paths of these underlying indices will be ~~published in an actuarial guideline and~~ updated from time to time.

(2)   For the ~~stochastic reserve~~Stochastic Reserve, the cash flow projections shall be made in a manner that reflect stochastically generated paths of U.S. Treasury yield curves, S&P 500 returns for general account equity assets, and future fund performance (for separate account assets). These stochastically generated paths shall be determined by:

(i)   Stochastic generators and model parameters prescribed by the NAIC; or

(ii)   Pre-packaged scenarios generated from stochastic generators and model parameters prescribed by the NAIC; or

(iii)   The use of ~~P~~proprietary ~~S~~scenario ~~S~~sets developed by the company for the purpose of calculating the ~~stochastic reserve~~Stochastic Reserve for policies within the scope of ~~this regulation~~these requirements; or

Drafting Note: The ~~P~~proprietary ~~S~~scenario ~~S~~set and weights will be constructed from a universe of scenarios in manner that produces a result that is reasonably similar to the prescribed CTE amount. This is needed to provide small to intermediate size companies an alternative to modeling a large representative sample from an interest rate generator, or a large number of prepackaged scenarios. Additional guidance is needed to assist the actuary in developing and justifying the use of appropriate ~~P~~proprietary ~~S~~scenario ~~S~~sets.

(iv)   Stochastic models developed by the company if mandated calibration criteria standards established by the NAIC are met. Returns for equity performance and groupings of variable funds shall be determined on a stochastic basis such that the resulting distribution of the ~~G~~gross ~~W~~wealth ~~R~~ratios of the ~~scenario~~Scenarios meets the scenario calibration criteria established by the NAIC. If the company chooses to use a fully integrated interest rate and equity return model, the equity return scenarios must satisfy the equity return calibration criteria adopted by the NAIC and the interest rate scenarios must satisfy the interest rate calibration criteria adopted by the NAIC.

Drafting Note: It is anticipated that a prescribed interest rate generator and model parameter values like the C3P1 generator, as well as a prescribed equity return generator and model parameter values will be ~~published in an actuarial guideline and~~ updated from time to time.

Drafting Note: It is also anticipated that the NAIC ~~actuarial guideline~~ will define a prescribed set of pre-packaged equity return scenarios similar to those used for C3P2 RBC requirements for variable annuities, as well as a prescribed set of pre-packaged interest rate scenarios.

Drafting Note: In addition, it is anticipated that ~~the guideline~~these requirements will contain calibration criteria for equity return models that are similar to those used for the C3P2 RBC requirements for variable annuities, as well as calibration criteria for interest rate models. Calibration criteria for interest rate models are in the process of being developed, and may not be available at the time the~~se~~ requirements are ~~regulation is~~ adopted.

Drafting Note: Ideally, a fully integrated model of interest rates, equity returns, and separate account fund performance would be used. If the company chooses to use a fully integrated interest rate and equity return model, the equity return scenarios must satisfy the equity return calibration criteria adopted by the NAIC and the interest rate scenarios must satisfy the interest rate calibration criteria adopted by the NAIC. The U.S. Treasury Fund scenarios within the 10,000 prepackaged scenarios for the C3P2 requirements qualify as meeting this standard. Although an integrated modeling approach is desirable, a number of simpler approaches are acceptable.

      (3)   The number of ~~scenario~~Scenarios for which ~~scenario reserve~~Scenario Reserves are computed shall be considered to be sufficient if any resulting understatement in total reserves, as compared with that resulting from running a broader or more robust range of additional ~~scenario~~Scenarios, is not material.

Drafting Note: More guidance is needed to assist the actuary in determining if a sufficient number of ~~scenario~~Scenarios have been used.

    E.   Starting and Projected Assets.

      (1)   Determination of ~~(a)~~ Starting Assets.

          (a)   For the projections supporting the reserve methodology, the value of assets at the ~~projection start date~~Projection Start Date shall be set equal to the estimated value of the ~~reported reserve~~Reported Reserve at the ~~projection start date~~Projection Start Date. However, in no event shall the total value of ~~starting assets~~Starting Assets (i.e., the sum of the value of ~~starting assets~~Starting Assets for all ~~asset segment~~Asset Segments) be less than a prescribed percentage, established by the NAIC, of the final ~~reported reserve~~Reported Reserve. When an ~~asset segment~~Asset Segment includes policies that are not subject to the~~se~~ requirements ~~model regulation~~, the actuary shall determine an equitable method to apportion the total amount of assets between the subject and non-subject policies. ~~Starting assets~~Starting Assets shall be valued consistently with their annual statement values. The amount of such asset values shall equal the sum of the following items, all as of the start of the ~~projection start date~~Projection Start Date:

              (i)   All of the separate account assets supporting the policies; and

              (ii)   An amount of assets held in the general account equal to the estimated value of the ~~reported reserve~~Reported Reserve as of the ~~projection start date~~Projection Start Date less the amount in Item (i) above.

          (b)   For products in which a substantial portion of policyholder funds are allocated to separate accounts, in many instances the initial general account assets may be negative, resulting in a projected interest expense. General account assets chosen for use as described above shall be selected on a consistent basis from one reserve valuation hereunder to the next.

      (2)   ~~Due and Accrued Investment Income. Starting assets~~Starting Assets shall include the balance of any due and accrued investment income on the invested assets included in the starting asset amount.

      (3)   ~~Treatment of Hedge Assets.~~ Any Derivative Instruments currently held at the start of the projection that are part of a Derivative Program ~~hedge assets~~ allocable to the business being valued ~~and meeting the requirements described in Paragraph (8) below~~ shall be reflected in the

projections and included with other general account assets under Subparagraph (a)(ii) above. To the extent the sum of the value of such ~~Derivative Instruments~~hedge assets and the value of assets in Subparagraph (a)(i) above is greater than the estimated value of the ~~reported reserve~~Reported Reserve as of the start of the projection, then Subparagraph (a)(ii) above may include enough negative general account assets or cash such that the sum of Subparagraph (a)(i) and (ii) above equals the estimated value of the ~~reported reserve~~Reported Reserve as of the start of the projection.

(4)   ~~Treatment of IMR.~~ Any positive IMR balance allocable to the business being valued may be included as a negative asset in the determination of the general account assets under Subsection D(2) above, thus allowing additional positive general account assets to be allocated to support the reserve calculation. Any negative IMR balance allocable to the business being valued, to the extent it offsets positive IMR balances elsewhere in the entity, must be included as a positive asset with the opposite effect as described above.

(5)   ~~Valuation of Projected Assets.~~ The values of projected ~~starting assets~~Starting Assets shall be determined in a manner consistent with their values at the start of the projection. For reinvestment assets, the value shall be determined in a manner consistent with the value of assets at the start of the projection that have similar investment characteristics.

(6)   ~~(a)~~   Grouping of equity investments in the general account.

    (a)   The portion of the starting asset amount held in the general account represented by equity investments (e.g. common stocks, real estate investments) may be grouped for modeling using an approach that establishes various equity investment categories, as determined by the actuary, with each investment category defined to reflect the different types of equity investments in the portfolio. In assigning each equity investment to an investment category, the fundamental characteristics of the asset shall have an appropriate relationship to the other assets assigned to the investment category.

    (b)   An appropriate proxy for each equity investment category shall be designed in order to develop the investment return paths. The development of the returns for the proxy equity investment categories is a fundamental step in the modeling and can have a significant effect on results. As such, the actuary must map each investment category to an appropriately crafted proxy investment category normally expressed as a linear combination of recognized market indices (or sub-indices). The proxy construction process should include an analysis that establishes a firm relationship between the investment return on the proxy and the specific equity investment category.

(7)   ~~(a)~~   Grouping of Variable Funds and Subaccounts.

    (a)   The portion of the starting asset amount held in the separate account represented by the variable funds and the corresponding account values may be grouped for modeling using an approach that recognizes the investment guidelines and objectives of the funds. In assigning each variable fund and the variable subaccounts to a grouping for projection purposes, the fundamental characteristics of the fund shall be reflected and the parameters shall have the appropriate relationship to the required calibration points of the S&P 500. The grouping shall reflect characteristics of the efficient frontier (i.e., returns generally cannot be increased without assuming additional risk).

    (b)   An appropriate proxy for each variable subaccount shall be designed in order to develop the investment return paths. The development of the returns for the proxy funds is a fundamental step in the modeling and can have a significant effect on results. As such, the actuary must map each variable account to an appropriately crafted proxy fund normally expressed as a linear combination of recognized market indices (or sub-indices). The proxy construction process should include an analysis that establishes a firm relationship between the investment return proxy and the specific variable funds.

(8)   ~~(a)~~   Modeling of Derivative Programs~~Hedges~~.

(a)   The appropriate costs and benefits of Derivative ~~hedging~~ Instruments that are currently held by the company in support of the policies falling under the scope of the~~se~~ requirements ~~regulation~~ shall be included in the projections when determining the Deterministic Reserve and the Stochastic Reserve. Except as provided in Subsection 5(H)(5)(f), the appropriate costs and benefits of anticipated future Derivative Instrument transactions associated with the execution of a Clearly Defined Hedging Strategy shall also be included in the projections when determining the Deterministic Reserve and the Stochastic Reserve. Except as provided in Subsection 5(H)(5)(f), the appropriate costs and benefits of anticipated future Derivative Instrument transactions associated with non-hedging Derivative Programs (e.g. replication, income generation) undertaken as part of the investment strategy supporting the policies shall ~~may~~ also be included in the projections when determining the ~~Deterministic Reserve~~Deterministic Reserve and the ~~Stochastic Reserve~~Stochastic Reserve provided they are normally modeled as part of the company's risk assessment and evaluation processes. Non-hedging programs included in the model must meet the principles outlined in Subsection 2 of these requirements (particularly Principle 7), and the actuary shall take due care in maintaining conditions in the model consistent with the requirements for permissibility of such programs. ~~If the company is following a clearly defined hedging strategy and the hedging strategy meets the requirements as defined in Section 7E(9) below, the projections shall take into account the appropriate costs and benefits of hedge positions expected to be held in the future through the execution of that strategy.~~

Drafting Note: The prohibition in these minimum reserve requirements against projecting future hedging transactions other than those associated with a Clearly Defined Hedging Strategy is intended to address initial concerns expressed by various parties that reserves could be unduly reduced by reflection of programs whose future execution and performance may have greater uncertainty. The prohibition appears however to be in conflict with Principle 2 of these requirements. Companies may actually execute and reflect in their risk assessment and evaluation processes hedging strategies similar in many ways to Clearly Defined Hedging Strategies but lack sufficient clarity in one or more of the qualification criteria. By excluding the associated derivative instruments, the investment strategy that is modeled may also not reflect the investment strategy the company actually uses. Further, since the future hedging transactions may be a net cost to the company in some scenarios and a net benefit in other scenarios, the exclusion of such transactions can result in a Reported Reserve that is either lower or higher than it would have been if the transactions were not excluded. The direction of such impact on the reserves could also change from period to period as the actual and projected paths of economic conditions change. A more graded approach to recognition of non-qualifying hedging strategies may be more theoretically consistent with Principle 2. The requirements stated here for handling hedging strategies are essentially consistent with those included in the CTE methodology portion of the September 2006 exposure draft of Actuarial Guideline VACARVM for variable annuity reserving. It is recommended that as greater experience is gained by actuaries and regulators with the principles-based approach and as industry hedging programs mature, the various requirements of this Subsection be reviewed.

~~Drafting Note: Permitting the modeling of hedges in the deterministic reserve calculation on policies that are subject to the stochastic modeling exclusion is still under study.~~

(b)   For each Derivative Program that is modeled, the Cash Flow Model shall as accurately as reasonably possible reflect the company's established investment policy and procedures for that program. The ultimate goal is for the Cash Flow Model to recognize all benefits, risks, and associated costs of each Derivative Program. The risks include, but are not limited to: basis, gap, price, parameter estimation, and variation in assumptions (mortality, persistency, withdrawal, etc.). Costs include, but are not limited to: transaction, margin (opportunity costs associated with margin requirements) and administration.

(c)   In circumstances where one or more material Risk Factors related to a Derivative Program are not fully captured within the Cash Flow Model and the resulting impact is material and could not be adequately or appropriately addressed by Margins in the assumptions, the actuary shall reflect such Risk Factors in the estimate of the Provision for Model Understatement, as described in Subsection 5(I)(2). ~~To the degree either the currently held included in the projections according to Subparagraph (a) abovehedge positions or the hedge positions expected to be held in the future introduce basis, gap,~~

~~price or assumption risk~~the, the determination of the

Drafting Note: Examples where Risk Factors may not be sufficiently reflected in the Cash Flow Model and would need to be reflected in the estimate of the Provision for Model Understatement are 1) a delta-only hedging strategy that does not adequately hedge the risks measured by the "Greeks" other than delta, and 2) financial indices underlying equity index Derivative Instruments that do not perform exactly like the separate account funds for variable universal life, and hence the use of Derivative Instruments has the potential for introducing basis risk. Note that some model simplifications may understate the impact of the program and overstate the residual risk, such as the assumption of rebalancing significantly less frequently than actual company practice. However the aggregate Provision for Model Understatement may not be negative.

~~a suitable reduction for effectiveness of hedges shall be made.~~ (d)   The actuary is responsible for verifying that each Derivative Program which is modeled as a Clearly Defined Hedging Strategy complies with the requirements of subsection E.9 below. ~~compliance with the requirements of a clearly defined hedging strategy for all hedge instruments included in the projections.~~

~~(c)~~   While Clearly Defined Hedging Strategies ~~hedging strategies~~ may change over time, any change in a Clearly Defined ~~H~~hedging ~~S~~strategy shall be documented and include an effective date of the change in strategy.

(e~~d~~)   These requirements do not supersede any statutes, laws or regulations of any state or jurisdiction related to the use of ~~derivative instruments~~other Derivative Instruments for hedging purposes and should not be used in determining whether a company is permitted to use such instruments in any state or jurisdiction.

(9)   ~~(a)~~   Requirements of a Clearly Defined Hedging Strategy.

(a)   In order to qualify as a C~~e~~learly D~~d~~efined ~~H~~hedging ~~S~~strategy, the strategy must meet the principles outlined in ~~Subs~~Section 24 of ~~this regulation~~these requirements (particularly Principle 7~~6~~) and shall, at a minimum, identify:

(i)   The specific risks being hedged (e.g., cash flow, policy interest credits, delta, rho, vega, etc.);

(ii)   The hedge objectives;

(iii)   The risks not being hedged (e.g., variation from expected mortality, withdrawal, and other utilization or decrement rates assumed in the hedging strategy, etc.);

(iv)   The financial instruments that will be used to hedge the risks;

(v)   The hedge trading rules including the permitted tolerances from hedging objectives;

(vi)   The metrics for measuring hedging effectiveness;

(vii)   The criteria that will be used to measure effectiveness;

(viii)   The frequency of measuring hedging effectiveness;

(ix)   The conditions under which hedging will not take place;

(x)   The person or persons responsible for implementing the hedging strategy;

(xi)   Areas where basis, gap or assumption risk related to the hedging strategy have been identified; and

(xii)   The circumstances under which hedging strategy will not be effective in hedging the risks.

(b)   The hedge strategy may be dynamic, static or a combination thereof.

(c)   Strategies involving the offsetting of the risks associated with other products outside of the scope of ~~this regulation~~these requirements do not currently qualify as a ~~C~~clearly ~~D~~defined ~~H~~hedging ~~S~~strategy.

F.   Net Asset Earned Rates and Discount Rates.

(1)   For calculating both the ~~D~~deterministic ~~R~~reserve and the ~~S~~stochastic ~~R~~reserve ~~calculations~~, a ~~C~~cash ~~F~~flow ~~M~~model shall be used to determine a path of ~~net asset earned rate~~Net Asset Earned Rates that reflects the net general account portfolio rate in each ~~projection interval~~Projection Interval (i.e., monthly, quarterly, annually). Separate Account returns are not included in the calculation of ~~net asset earned rate~~Net Asset Earned Rates. This path of ~~net asset earned rate~~Net Asset Earned Rates will vary by ~~asset segment~~Asset Segment and for each ~~scenario~~Scenario, and will depend on, among other things:

(a)   The projected ~~net investment earnings~~Net Investment Earnings from the portfolio of ~~starting assets~~Starting Assets;

(b)   The pattern of projected asset cash flows from the ~~starting assets~~Starting Assets and subsequent reinvestment assets;

(c)   The pattern of net liability cash flows; and

(d)   The projected ~~net investment earnings~~Net Investment Earnings from reinvestment assets.

(2)   The ~~net asset earned rate~~Net Asset Earned Rate for each ~~projection interval~~Projection Interval shall be computed in a manner that is consistent with the timing of cash flows and length of the ~~projection interval~~Projection Interval of the related ~~cash flow model~~Cash Flow Model. It shall be calculated as the ratio of ~~net investment earnings~~Net Investment Earnings divided by invested assets. The following considerations pertain to the calculation of this ratio:

(a)   ~~Net investment earnings~~Net Investment Earnings shall include investment income plus capital gains and losses (excluding capital gains and losses that are included in the IMR), minus appropriate default costs and investment expenses.

(b)   ~~Net investment earnings~~Net Investment Earnings shall also include any change in due and accrued investment income during the ~~projection interval~~Projection Interval.

(c)   ~~Net investment earnings~~Net Investment Earnings shall also include income from Derivative Asset Programs~~hedge instruments~~ and amortization of the interest maintenance reserve on all applicable assets.

(d)   Policy loan interest (net of investment expenses) and policy loan balances shall be included in the calculation.

(e)   Invested assets shall be determined in a manner that is consistent with the timing of cash flows within and the length of the ~~projection interval~~Projection Interval of the ~~cash flow model~~Cash Flow Model.

(f)   The outstanding interest maintenance reserve shall be reflected as an adjustment to invested assets. Any negative IMR balance can only be reflected to the extent that a positive IMR balance exists on policies outside the scope of ~~this regulation~~these requirements.

(g)   The annual ~~stat~~statement ~~utory~~ value of Derivative Instruments ~~hedge instruments~~ shall be included in invested assets. Reasonable approximations are acceptable.

(h)   All items reflected in the ratio shall be consistent with statutory asset valuation, including reflection of accrued and unearned investment income where appropriate.

Drafting Note: ~~Subs~~Section ~~5~~7C(8) permits the use of simplified approaches to calculate the ~~deterministic reserve~~Deterministic Reserve and ~~stochastic reserve~~Stochastic Reserve. This availability for simplification includes ways to determine appropriate ~~net asset earned rate~~Net Asset Earned Rates. Small to intermediate size companies, or any size company with smaller blocks of business, have options to create ~~net asset earned rate~~Net Asset Earned Rates under simplified approaches if they continue to meet the requirements of ~~Subs~~Section ~~5~~7C(8).

(3)   The path of ~~discount rates~~Discount Rates for each ~~asset segment~~Asset Segment shall be equal to the path of ~~net asset earned rate~~Net Asset Earned Rates.

(4)   ~~Reliability of discount rates.~~ As a test of the consistency between the Discount Rates and the investment process being modeled, the actuary shall perform the following calculation:

(a)~~1.~~   For a selected Scenario and ~~Asset Segment~~Asset Segment, set the starting asset amount exactly equal to the ~~Scenario Reserve~~Scenario Reserve for that ~~Asset Segment~~Asset Segment (which is likely to be different than the starting asset amount used to determine the ~~Scenario Reserve~~Scenario Reserve).

(b)~~2.~~   Project the accumulated assets to the end of the Projection Year that gave rise to the Greatest Present Value of Accumulated Deficiencies using the same model and assumptions used to calculate the ~~Scenario Reserve~~Scenario Reserve.

(c)~~3.~~   Discount the value in Paragraph (4)(b)~~C.2~~ to the ~~valuation date~~Valuation Date using the path of Discount Rates used to calculate the ~~Scenario Reserve~~Scenario Reserve.

(d)~~4.~~   Provide an explanation if the amount in Paragraph ~~C.3.~~(4)(c) is materially different than zero.

Drafting Note: The NAIC will determine the frequency of the test and the Scenario to be used.

G.   The ~~Deterministic Reserve~~Deterministic Reserve.

(1)   Purpose. The purpose of the ~~deterministic reserve~~Deterministic Reserve is to produce a reserve that is adequate to cover the product benefits and expense, reflecting future revenue, under a single scenario. However, it is not meant to explicitly capture material tail risk.

(2)   Reserve Calculation Description. The ~~deterministic reserve~~Deterministic Reserve is determined using the following steps:

(a)   Determine ~~prudent best estimate assumption~~Prudent Estimate Assumptions as defined in ~~Subs~~Section ~~5~~7B.

(b)   Project cash flows for each ~~policy~~Policy as described in ~~Subs~~Sections ~~5~~7C, ~~5~~7D, and ~~5~~7E.

(c)   Calculate the path of ~~net asset earned rate~~Net Asset Earned Rates for each ~~asset segment~~Asset Segment as described in ~~Subs~~Section ~~5~~7F.

(d)   Calculate the seriatim reserve for each ~~policy~~Policy using the methodology described in ~~Subs~~Section ~~5~~7G(3).

(e)   Calculate the ~~per policy reserve~~Per Policy Reserve for each ~~policy~~Policy as described in Subsection 5G(4).

25

(f)   Calculate the ~~deterministic reserve~~Deterministic Reserve as described ~~Subs~~Section ~~57~~G(~~54~~).

(3)   Calculation of the Seriatim Reserve for Each Policy.

(a)   Use the ~~cash flow model~~Cash Flow Model to project the numbers in Items (i) through (v) below for each ~~policy~~Policy. Use the path of ~~net asset earned rate~~Net Asset Earned Rates as appropriate to determine benefits, expenses and revenue that depend on earned rates. For example, earned rates are needed to determine the level of cash surrender benefits.

(i)   The future benefits for each ~~policy~~Policy, including but not limited to death and cash surrender benefits;

(ii)   The future expenses for each ~~policy~~Policy, including but not limited to, commissions, general expenses, and premium taxes. Federal income taxes (and expenses paid to provide fraternal benefits in lieu of federal income taxes) are excluded;

(iii)   The future gross premium payments for each ~~policy~~Policy;

(iv)   Other applicable revenue for each ~~policy~~Policy, such as fees and revenue on assets invested in sub-accounts, and any revenue sharing income; and

(v)   The future net cash flows to or from the general account from or to the separate account for each ~~policy~~Policy.

(vi)   The portion of the aggregate Derivative Liability Program net cash flows allocable to each Policy, where such allocation shall be performed by the actuary in a manner that is reasonable and practical.

(b)   The seriatim reserve for each ~~policy~~Policy is equal to:

(i)   The present value of future benefits determined by discounting the future benefits using the path of ~~discount rates~~Discount Rates for the corresponding ~~asset segment~~Asset Segment; plus

(ii)   The present value of future expenses determined by discounting the future expenses using the path of ~~discount rates~~Discount Rates for the corresponding ~~asset segment~~Asset Segment; plus

(iii)   The policy account value invested in the separate account at the ~~valuation date~~Valuation Date ; minus

(iv)   The present value of future gross premium payments and/or other applicable revenue determined by discounting these future premiums and other revenue using the path of ~~discount rates~~Discount Rates for the corresponding ~~asset segment~~Asset Segment; minus

(v)   The present value of future net cash flows to or from the general account from or to the separate account determined by discounting these future net cash flows using the path of ~~discount rates~~Discount Rates for the corresponding ~~asset segment~~Asset Segment; minus~~.~~

(vi)   The present value of the Derivative Liability Program net cash flow (i.e. cash received minus cash paid) that is allocated to such Policy.

(4) The Per Policy Reserve for each Policy is equal to the greater of the Seriatim Reserve and the Cash Surrender Value for the Policy.

(5~~4~~) The ~~Deterministic Reserve~~Deterministic Reserve

 (a) The ~~deterministic reserve~~Deterministic Reserve equals the sum of the ~~per policy reserve~~Per Policy Reserve as of the ~~valuation date~~Valuation Date for all policies falling under the scope of ~~this regulation~~these requirements.

 (b) If the ~~per policy reserve~~Per Policy Reserve for each ~~policy~~Policy is determined on a date that precedes the ~~valuation date~~Valuation Date, then the ~~per policy reserve~~Per Policy Reserves shall be adjusted to the ~~valuation date~~Valuation Date.

H. The ~~Stochastic Reserve~~Stochastic Reserve.

(1) ~~Purpose.~~ The purpose of the ~~S~~stochastic ~~R~~reserve is to produce a reserve that is adequate to cover the product benefits, revenue and expenses over a broad range of stochastically generated ~~scenario~~Scenarios for all policies falling under the scope of ~~this regulation~~these requirements. It is meant to capture all material risks, including material tail risk. The ~~stochastic reserve~~Stochastic Reserve may be determined assuming that all, or only some, of the risks underlying the policies are modeled stochastically, but at a minimum, it must assume that interest rate movements, equity movements, and separate account fund performance be modeled stochastically.

(2) ~~Reserve Calculation Description.~~ The ~~S~~stochastic ~~R~~reserve is determined using the following steps:

 (a) Determine policy grouping as defined in ~~Subs~~Section 5~~7~~H(3);

 (b) Determine ~~prudent best estimate assumption~~Prudent Estimate Assumptions as defined in ~~Subs~~Section 5~~7~~B;

 (c) Project cash flows for each ~~asset segment~~Asset Segment for each ~~scenario~~Scenario as described in ~~Subs~~Sections 5~~7~~C, 5~~7~~D, and 5~~7~~E;

 (d) Calculate the path of ~~net asset earned rate~~Net Asset Earned Rates and ~~discount rates~~Discount Rates for each ~~asset segment~~Asset Segment for each ~~scenario~~Scenario as described in ~~Subs~~Section 5~~7~~F;

 (e) Calculate the ~~scenario reserve~~Scenario Reserve for each ~~scenario~~Scenario using the methodology described in ~~Subs~~Section 5~~7~~H(4);

 (f) Calculate the ~~stochastic reserve~~Stochastic Reserve as described in ~~Subs~~Section 5~~7~~H(6).

(3) ~~Grouping of Policies for Modeling.~~ Projections may be performed for each ~~policy~~Policy in force on the date of valuation or by grouping policies into representative cells of model plans using all characteristics and criteria having a material impact on the size of the reserve. Grouping may not be done in a manner that intentionally understates the resulting ~~reported reserve~~Reported Reserve.

(4) Calculation of the ~~S~~scenario ~~R~~reserve.

 (a) For each ~~scenario~~Scenario, the ~~scenario reserve~~Scenario Reserves is determined by following Items (i) through (v) below:

  (i) Calculate the net accumulated asset amount for each ~~asset segment~~Asset Segment at the end of each ~~projection year~~Projection Year and at the ~~projection start date~~Projection Start Date, as described in Paragraph (b) below. Note that the net accumulated asset amount can be either positive or negative.

(ii)   Calculate the ~~accumulated deficiency~~Accumulated Deficiency for each ~~asset segment~~Asset Segment at the end of each ~~projection year~~Projection Year and at the ~~projection start date~~Projection Start Date -by taking the negative of the net accumulated asset amount for the ~~asset segment~~Asset Segment. Note that the ~~accumulated deficiency~~Accumulated Deficiency can be either positive or negative.

(iii)   At the end of each ~~projection year~~Projection Year and at the ~~projection start date~~Projection Start Date, calculate the discounted value of the ~~accumulated deficiency~~Accumulated Deficiency for each ~~asset segment~~Asset Segment that was calculated in Item (ii). The discounted value shall be calculated using the path of ~~discount rates~~Discount Rates for the ~~asset segment~~Asset Segment from the ~~projection start date~~Projection Start Date to the end of the respective ~~projection year~~Projection Year.

(iv)   Determine the aggregate discounted value of the ~~accumulated deficiency~~Accumulated Deficiency at the end of each ~~projection year~~Projection Year and at the ~~projection start date~~Projection Start Date as the sum of the discounted value of ~~accumulated deficiency~~Accumulated Deficiency at that duration across all ~~asset segment~~Asset Segments.

(v)   Determine the ~~scenario reserve~~Scenario Reserve as the sum of (a) the statement value of the ~~starting assets~~Starting Assets across all ~~asset segment~~Asset Segments and (b) the maximum of the values calculated in Item (iv). Note that the amount described in (b) can be either positive or negative.

Drafting Note: The definition of ~~accumulated deficiency~~Accumulated Deficiency used in the calculation of the ~~scenario reserve~~Scenario Reserve needs further discussion and analysis before it is finalized.

(b)   For each ~~scenario~~Scenario the net accumulated asset amount for an ~~asset segment~~Asset Segment at the end of each ~~projection year~~Projection Year is equal to the projected statement value of invested assets for that ~~asset segment~~Asset Segment. For all ~~scenario~~Scenarios, the net accumulated asset amount for an ~~asset segment~~Asset Segment at the ~~projection start date~~Projection Start Date is the annual statement value of ~~starting assets~~Starting Assets for that ~~asset segment~~Asset Segment. The projected annual statement value of invested assets at any future duration must reflect the accumulation of cash flows into and out of the portfolio for the items listed in (i) through (vi~~i~~) as described in ~~Subs~~Sections ~~57~~C(2) and ~~57~~C(3). The net accumulated asset amount can be either positive or negative.

(i)   Benefits, including but not limited to death and cash surrender benefits;

(ii)   Expenses, including but not limited to, commissions, general expenses, and premium taxes, but excluding federal income taxes and expenses paid to provide fraternal benefits in lieu of federal income taxes;

(iii)   Gross premium payments;

(iv)   Other applicable revenue such as fees and revenue on assets invested in sub-accounts, and any revenue sharing income;

(v)   Net payments to or from the general account from or to the separate account; and

(vi)   Net Investment Earnings as defined in ~~Subs~~Section ~~57~~F(2).

(vii)   Net cash flows from Derivative Liability Programs.

(5)   Stochastic Modeling Exclusion.

(a)　　It may not be necessary to perform stochastic modeling for groups of policies where it can be demonstrated that the Standalone S~~s~~tochastic R~~r~~eserve for those policies will not be greater than the Modified D~~d~~eterministic R~~r~~eserve. Such demonstration shall take into account the effect of any Provision for Model Understatement for the group of policies. Thus, the actuary may elect to exclude certain groups of policies from the stochastic modeling requirement upon demonstration that the Modified ~~recalculated~~ D~~d~~eterministic R~~r~~eserve for those policies (which includes any additional reserve amount that the actuary may decide to add for the purpose of the stochastic modeling exclusion) will adequately provide for all material risks underlying such policies.

(b)　　The Standalone Stochastic Reserve equals the amount resulting from the Stochastic Reserve calculation described in Subsection 5H(2), but ignoring the step described in Subsection 5H(6)(c), and only including the group of policies subject to the stochastic modeling exclusion.

(c~~a~~)　　To exclude a group of polices from the stochastic modeling requirement, the actuary shall, for the group of policies to be excluded:

　　　(i)　　Determine the M~~recalculated~~odified D~~d~~eterministic R~~r~~eserve for these policies, which equals the sum of the amounts in (I) and (II) below:

　　　　　(I)　　The greater of the aggregate deterministic ~~scenario reserve~~Scenario Reserve (as described in ~~see~~ Subs~~S~~ection 5~~7~~H(5)(b) below) and the sum of the ~~per policy reserve~~Per Policy Reserves for these policies.

　　　　　(II)　　An additional reserve amount that the actuary may decide to include for the purpose of the stochastic modeling exclusion.

　　　(ii)　　Provide a demonstration that the M~~recalculated~~odified D~~d~~eterministic R~~r~~eserve adequately provides for all material risks underlying such policies. An acceptable demonstration shall

　　　　　(I)　　Provide a reasonable assurance that if the Standalone S~~s~~tochastic R~~r~~eserve was calculated for only those polices subject to the stochastic modeling exclusion~~,~~ it would not be greater than the M~~recalculated~~odified ~~deterministic reserve~~Deterministic Reserve for such policies after reflecting the effect of any Provision for Model Understatement for such policies;

　　　　　(II)　　Provide sufficient supporting information that an experienced independent actuarial reviewer can assess the reasonableness of the conclusion to exclude the group of policies; and

　　　　　(III)　　Provide an effective evaluation of the residual risk exposure resulting from risk mitigation techniques such as Derivative Programs ~~hedge instruments~~ and reinsurance.

　　　(iii)　　A complete demonstration supporting the exclusion must be provided in the ~~actuarial report~~Actuarial Report in the initial exclusion year and at least once every three (3) calendar years subsequent to the initial exclusion. Any demonstration shall take into account whether changing conditions over the current and two (2) subsequent calendar years would be likely to change the conclusion to exclude the group of policies from the stochastic modeling requirement. If, as of the end of any calendar year, the actuary determines the Standalone S~~s~~tochastic reserve will exceed the M~~recalculated~~odified ~~deterministic reserve~~Deterministic Reserve for the group of policies, the exclusion shall be discontinued and the policies shall be included in the stochastic modeling calculations.

(~~d~~b) Examples of acceptable methods to demonstrate that the exclusion requirements are met for a group of policies include, but are not limited to:

    (i) Calculating the Standalone Stochastic Reserve and comparing it to the ~~Comparing the recalculated~~Modified ~~D~~deterministic ~~R~~reserve ~~to the stochastic reserve directly~~;

    (ii) Comparing the ~~M~~recalculated~~odified~~ ~~D~~deterministic ~~R~~reserve to a set of ~~S~~scenario ~~R~~reserves resulting from a sufficient number of adverse deterministic scenarios selected by the actuary that are "in the tail" to demonstrate that the ~~stochastic reserve~~Stochastic Reserve would be less than the ~~M~~recalculated~~odified~~ ~~D~~deterministic ~~R~~reserve;

    (iii) Comparing the ~~M~~recalculated~~odified~~ ~~D~~deterministic ~~R~~reserve to a modified ~~stochastic reserve~~Stochastic Reserve that is calculated using a representative sample of policies to demonstrate that the ~~stochastic reserve~~Stochastic Reserve would be less than the ~~M~~recalculated~~odified~~ ~~deterministic reserve~~Deterministic Reserve;

    (iv) Comparing the ~~M~~recalculated~~odified~~ ~~D~~deterministic ~~R~~reserve to the ~~S~~stochastic ~~R~~reserve on a date that precedes the ~~projection start date~~Projection Start Date;

    (v) Demonstrating that any risk characteristics that would otherwise cause the ~~stochastic reserve~~Stochastic Reserve to exceed the ~~recalculated~~modified ~~deterministic reserve~~Deterministic Reserve are not present or have been substantially eliminated through action such as: a) hedging; b) investment strategy; c) reinsurance; or d) passing on to the policyholder by contract provision.

(~~e~~e) The ~~A~~aggregate ~~D~~deterministic ~~scenario reserve~~Scenario Reserve is equal to the greatest present value of accumulated deficiencies at the end of each ~~projection year~~Projection Year and at the ~~projection start date~~Projection Start Date, where the ~~accumulated deficiency~~Accumulated Deficiency for each duration is determined in the aggregate for all polices using the steps outlined in ~~Paragraph~~Subsection H(4) above, but using the cash flows for items listed in ~~Paragraph~~Subsection H4(b)(i) through (vi) that are used to calculate the ~~deterministic reserve~~Deterministic Reserve.

(f) A group of policies for which there is one or more Clearly Defined Hedging Strategy shall not be eligible for the Stochastic Modeling Exclusion except:

    (i) if each Clearly Defined Hedging Strategy serves as [insert a list of acceptable exceptions], or

    (ii) ~~(ii)~~ if approved by the commissioner where one requirement for such approval is for the actuary to clearly demonstrate that each Clearly Defined Hedging Strategy does not violate Principle 7.

In addition, future transactions associated with non-hedging Derivative Programs may not be reflected in the reserve calculation for groups of policies for which the Stochastic Modeling Exclusion is elected.

Drafting Note: The list of acceptable exceptions ~~could~~shall include a description of a cash flow hedge (e.g. an asset swap) and a hedge of interest credits on a group of ~~E~~equity indexed universal life~~IUL~~ policies that satisfies Actuarial Guideline 36 requirements for policies eligible for a book value reserving method.

(6) The ~~Stochastic Reserve~~Stochastic Reserve. The ~~stochastic reserve~~Stochastic Reserve is calculated for all policies falling under the scope of ~~this regulation~~these requirements and shall be determined as follows:

(a)   Rank the ~~scenario reserve~~Scenario Reserves from lowest to highest;

(b)   Take the average of highest (100-CTE risk level) % of the ~~S~~scenario ~~r~~Reserves, where the CTE risk level is <insert CTE risk level determined by the NAIC>.

(c)   Add to Subparagraph (b) above the ~~M~~recalculated~~odified D~~deterministic ~~r~~Reserve for all policies that are subject to the stochastic modeling exclusion; and

(d)   If the ~~scenario reserve~~Scenario Reserves are determined on a date that precedes the ~~valuation date~~Valuation Date, then the ~~scenario reserve~~Scenario Reserves shall be adjusted to the ~~valuation date~~Valuation Date before performing Subparagraphs (a) through (c) above.

Drafting Note: ~~The CTE risk level shall be determined by the NAIC.~~ If ~~Proprietary~~pre determined ~~S~~scenarios ~~S~~sets are used, the derivation of the ~~S~~stochastic ~~R~~reserve will be calculated ~~defined~~ using a different method defined by the NAIC ~~by actuarial guideline,~~ rather than the process defined above.

(7)   Aggregation of policies

(a)   ~~Aggregation.~~ Aggregation of policies to reflect offsetting risks is permitted when calculating the ~~S~~stochastic ~~R~~reserve. However, since the~~se requirements~~ ~~regulation~~ requires the ~~S~~stochastic ~~R~~reserve be compared to a seriatim ~~D~~deterministic ~~R~~reserve that uses the ~~C~~cash ~~S~~surrender ~~V~~value as a minimum floor on a policy by policy basis, this comparison imposes a limitation on the magnitude of any risk offsets that may be reflected in the ~~R~~reported ~~R~~reserve.

(b)   The ~~stochastic reserve~~Stochastic Reserve may be calculated separately for subsets of the policies. If this approach is followed, the comparison of the ~~deterministic reserve~~Deterministic Reserve to the ~~stochastic reserve~~Stochastic Reserve may be made in the aggregate. In this case, the ~~stochastic reserve~~Stochastic Reserve for each subset of policies is determined by following the methodology in ~~Paragraph~~Subsection (H)2 separately for each subset of policies.

(c~~8~~)   Impact of Aggregation: The actuary shall disclose the estimated impact of aggregation, that is, the degree of risk offsets reflected in the ~~reported reserve~~Reported Reserve due to aggregating groups of policies when performing the ~~stochastic reserve~~Stochastic Reserve calculation.

(1~~a~~)   The impact of aggregation on the ~~R~~reported ~~R~~reserve shall be determined by:

(i)   Subdividing the total block of policies subject to the~~se requirements~~ ~~regulation~~ into subgroups that reflect similar risk characteristics that will likely create risk offsets when aggregated together;

(ii)   Determining the ~~R~~reported ~~R~~reserve for each subgroup of policies;

(iii)   Summing the ~~R~~reported ~~R~~reserves for each subgroup of polices, and subtracting the actual ~~R~~reported ~~R~~reserve for all policies.

(2~~b~~)   Examples of risk characteristic that the actuary may consider when selecting the number of subgroups include:

(i)   Separate account vs. general account policies;

(ii)   Flexible premium vs. fixed premium policies;

(iii)   Policies with cash values vs. polices with little or no cash values.

(3e) The actuary shall disclose in the ~~actuarial report~~Actuarial Report the impact of aggregation at least once every three (3) years, and in the current year regardless of the three (3) year requirement if the company has made a material change in its risk profile, such as buying or selling a block of business, or entering into (or canceling) a reinsurance arrangement coving the policies subject to the~~se~~ requirements ~~regulation~~.

(4d) The actuary can use reasonable approximations when performing this demonstration, but must fully disclose the nature of the approximations used and the rationale for why the approximations are appropriate.

(5e) The actuary can use a date that precedes the ~~valuation date~~Valuation Date to perform this demonstration, but shall certify that the use of such date will not produce a material change in the results if the results were based on the ~~valuation date~~Valuation Date.

I. The ~~Reported Reserve~~Reported Reserve.

(1) The ~~reported reserve~~Reported Reserve shall equal the sum of (a) and (b).~~greater of:~~

   (a) The greater of:

      (i) The ~~deterministic reserve~~Deterministic Reserve; and

      (bii) The ~~stochastic reserve~~Stochastic Reserve.

   (b) The Provision for Model Understatement as defined below.

(2) Provision for Model Understatement.

   (a) The Provision for Model Understatement is the actuary's estimate of the understatement in the amount determined in Subparagraph (1)(a) above due to the net aggregate impact of material approximations, simplifying assumptions or simplified techniques used in the Cash Flow Model to measure the Risk Factors, investment strategies, risk mitigation strategies, and other components of the methodology defined by these requirements, and where such understatement could not be adequately or appropriately reflected by Margins in the various assumptions.

   (b) The Provision for Model Understatement does not add to or supersede other requirements in this section, such as those related to acceptable methods of setting Prudent Estimate Assumptions, calibrating scenarios, etc. It is intended to address areas in which the Cash Flow Model was not able to directly and fully carry out those requirements and the resulting understatement on a net aggregate basis is material.

   (c) The Provision for Model Understatement shall not be less than zero.

(32) If there is separate account business, the ~~reported reserve~~Reported Reserve shall be allocated between the general and separate accounts as follows:

   (a) The amount of reserve held in the general account shall be the difference, whether positive or negative, between the ~~reported reserve~~Reported Reserve and the reserve held in the separate account as of the ~~valuation date~~Valuation Date.

   (b) The amount of reserve held in the separate account shall be an amount not less than the sum of the account values held in the separate account for policies being valued as of the ~~valuation date~~Valuation Date.

Drafting Note: More guidance is needed to establish the separate account values as of the ~~valuation date~~Valuation Date.

J. Treatment of Non-Guaranteed Elements.

(1) Non-guaranteed elements are to be included in the models used to project future cash flows for both the ~~deterministic reserve~~Deterministic Reserve and the ~~stochastic reserve~~Stochastic Reserve. Where NGE are based on some aspect of experience, future changes in the level of NGE can be reflected in the ~~cash flow model~~Cash Flow Models based on the experience assumed in each ~~scenario~~Scenario. The intent is to ~~model the determination of NGE as the company would actually set them if experience unfolded in a manner consistent with the ~~scenario~~Scenario under consideration, but reflecting a ~~margin~~Margin for uncertainty as described below.

(2) As would be the case in actual practice, the projected NGE should not be assumed to change simultaneously with the change in projected experience, but only at the date following the recognition of a change in experience on which the company would normally implement a change.

(3) When determining the NGE assumption for each ~~scenario~~Scenario, the actuary must take into consideration those factors that could cause the company to modify its current NGE scale and/or its current NGE spreads, such as existence of contract guarantees.

(4) Due to the uncertainty in the future level of NGE arising from factors such as those listed below, a ~~margin~~Margin should be established on the NGE assumption that would result in an increase in the reserve compared to the reserve level that would result from assuming that each Non-guaranteed element equals the experience of the ~~scenario~~Scenario plus 100% of the current NGE spread. Factors that must be considered when determining the ~~margin~~Margin include:

(a) The company's ability to modify its non-guaranteed element scale and/or NGE spreads, and the company's past NGE practices and current NGE policies;

(b) Impact on policyholder behavior by maintaining the current non-guaranteed element scale and/or NGE spreads under the ~~scenario~~Scenario;

(c) Impact of the NGE assumption on the competitive position of the product under the ~~scenario~~Scenario;

(d) The size of the ~~margin~~Margin as measured by the method used to calculate the ~~margin~~Margin ratio as described in ~~Subs~~Section ~~5~~7B(7).

(5) Any liability for dividends declared but not yet paid that has been established according to statutory accounting principles as of the ~~valuation date~~Valuation Date shall be reported separately from the ~~reported reserve~~Reported Reserve. Accordingly, where such a separate liability is reported on the statutory balance sheet as of the ~~valuation date~~Valuation Date, any dividends that are included in the separate liability shall be excluded from the reserve cash flow projection.

K. Treatment of Supplemental Benefits. Reserves for supplemental benefits may be calculated separately when calculating the ~~deterministic reserve~~Deterministic Reserve and the ~~stochastic reserve~~Stochastic Reserve.

L. Allocation of ~~Reported Reserve~~Reported Reserve to Individual Policies.

(1~~1~~) When the ~~R~~reported ~~R~~reserve is equal to the ~~D~~deterministic ~~R~~reserve, the ~~R~~reported ~~R~~reserve allocated to each Policy ~~contract~~ shall be the ~~P~~per ~~P~~policy ~~R~~reserve ~~for each policy~~ as defined in Subsection ~~5~~G(4)~~(a)~~.

(2~~2~~) When the ~~R~~reported ~~R~~reserve is greater than the Deterministic Reserve, ~~equal to the stochastic reserve,~~ the reserve allocated to each ~~P~~policy shall be the ~~P~~per ~~P~~policy ~~R~~reserve ~~for each policy~~ as defined in Subsection ~~5~~G(4)~~(a)~~, plus an allocation of the excess of the ~~R~~reported ~~R~~reserve over the ~~D~~deterministic ~~R~~reserve. The allocation shall be made in proportion to the ~~P~~per ~~P~~policy ~~R~~reserve for each ~~P~~policy ~~as defined in Subsection G(4)(a)~~.

Drafting Note: It is the intent of this section to allocate the ~~reported reserve~~Reported Reserve back to the individual ~~policy~~Policy that gave rise to the reserve. The allocation to individual policies is needed, among other reasons, to allocate assets under the Life and Health Insurance Guaranty Association Model Act.

~~Subs~~Section ~~6~~8. **Requirements for Reinsurance**

A.   General Considerations.

   (1)   The terms "reinsurance" and "reinsurer" in this Section include retrocession and retrocessionaire respectively.

   (2)   The assumptions that are used by a ceding company to determine the ~~reported reserve~~Reported Reserve and the notional gross reserve for policies that are ceded to a reinsurer shall be appropriate for the ceding company and need not be the same as the assumptions used by the assuming company to determine the ~~reported reserve~~Reported Reserve for these policies. As a consequence, the credit for reinsurance ceded calculated by the ceding company may not necessarily be equal to the ~~reported reserve~~Reported Reserve set up by the assuming company.

   (3)   The actuary for one party of a reinsurance transaction may rely on the reserve calculations performed by the actuary for the other party. However, appropriate adjustments to these calculations must be made, if necessary, to reflect Prudent Estimate Assumptions suitable to his or her own company.

   (4~~3~~)   Since any increase or decrease in actual risk should be reflected in principles-based reserves, it is possible for reinsurance to decrease (or increase) the aggregate risk faced by the ceding and assuming company with respect to the reinsured policies, and if so, the sum of the reserves held by the two companies should decrease (or increase). In any case, the sum of the reserves held by the ceding and assuming companies should not be less than the sum of the ~~deterministic reserve~~Deterministic Reserves held by the companies, and this sum will not, in turn, be less than the total ~~cash surrender value~~Cash Surrender Value for the reinsured policies.

B.   Reinsurance Ceded.

   (1)   Cash Flows for Reinsurance Ceded. The cash flows used in calculating the ~~deterministic reserve~~Deterministic Reserve and ~~stochastic reserve~~Stochastic Reserves shall include the effect of cash flows received from or paid to reinsurers under the terms of such ceded reinsurance agreements that meet the requirements for accounting as reinsurance. Cash flows received from and paid to reinsurers under the terms of any reinsurance agreement that does not meet the requirements for accounting as reinsurance of the regulation shall be taken into account by the ceding company only if doing so results in an increase in the ~~reported reserve~~Reported Reserve held for such policies.

Drafting Note: Further guidance is needed on the treatment of non-proportional reinsurance in the Cash flow Model, such as aggregate stop-loss arrangements.

   (2)   ~~Cash Surrender Value~~Cash Surrender Value Floor. In applying ~~Subs~~Section 5~~7~~G(4)(a) (the ~~cash surrender value~~Cash Surrender Value floor under the ~~deterministic reserve~~Deterministic Reserve) the ~~cash surrender value~~Cash Surrender Value shall be taken to be that portion of the ~~cash surrender value~~Cash Surrender Value of the ~~policy~~Policy that the company is obligated to pay after taking into account the terms of any reinsurance agreements meeting the requirements for accounting as reinsurance.

   (3)   Assumptions for Reinsurance Ceded. The assumptions used to project cash flows to and from reinsurers should be consistent with other assumptions used by the ceding company in calculating the ~~reported reserve~~Reported Reserve for the reinsured policies, and should reflect the terms of the reinsurance agreement. Current laws and regulations regarding credit for reinsurance should be assumed to remain in effect throughout the projection. The actuary shall include a ~~margin~~Margin

that has the effect of increasing the ~~reported reserve~~Reported Reserve if the ~~margin~~Margin is necessary to reflect uncertainty regarding the reinsurance cashflows received from the reinsurer. Uncertainty is likely to be present if the current terms of the reinsurance agreement are not guaranteed for the entire ~~projection period~~Projection Period used in calculating the ~~reported reserve~~Reported Reserve.

(4) Credit for Reinsurance. While it is recognized that the actuary's primary responsibility is to determine the appropriate liability net of reinsurance, a notional gross reserve shall be calculated using methods and assumptions consistent with those used in calculating the ~~reported reserve~~Reported Reserve, but excluding the effect of reinsurance. The credit for reinsurance ceded shall be the excess, if any, of the notional gross reserve over the ~~reported reserve~~Reported Reserve, for agreements that meet the requirements for accounting as reinsurance. The assumptions used to calculate the notional gross reserve are to some degree hypothetical, since this is not the situation that actually occurs. For example, assets backing ceded reserves may be held by the reinsurer, not the ceding company. The ceding company should use assumptions that represent what company experience would be if the reinsurance were not entered into and the business was managed in a manner consistent with the manner the retained business is managed.

Drafting Note: Current laws and regulations regarding reserve credit restrict the terms of reinsurance agreements for which credit may be taken and prescribe conditions under which reinsurance credit may be taken with respect to unauthorized reinsurers. A review of these laws and regulations in light of principles-based reserving may be appropriate.

C. Reinsurance Assumed.

(1) Cash Flows for Reinsurance Assumed. The cash flows used in calculating the ~~deterministic reserve~~Deterministic Reserve and the ~~stochastic reserve~~Stochastic Reserve shall include the effect of cash flows received from and paid to ceding companies under the terms of assumed reinsurance agreements.

(2) ~~Cash Surrender Value~~Cash Surrender Value Floor. In applying ~~Subs~~Section 7G(4)(a) (the ~~cash surrender value~~Cash Surrender Value floor for the ~~deterministic reserve~~Deterministic Reserve), the ~~cash surrender value~~Cash Surrender Value for each assumed ~~policy~~Policy shall be taken to be that portion of the ~~cash surrender value~~Cash Surrender Value of the ~~policy~~Policy that the company is obligated to pay after taking into account the terms of any reinsurance agreements.

(3) Assumptions for Reinsurance Assumed. The assumptions used to estimate cash flows to or from the ceding company should reflect the reinsurer's (i.e. the assuming company's) experience for the business segment to which the reinsured policies belong, and should reflect the terms of the reinsurance agreement. In particular, if reinsurance premiums or allowances are not guaranteed, the actuary should consider treating them in the same manner as a non-guaranteed element.

~~**Section 9.   Reporting of Experience**~~

~~A.   Unless exempted by the commissioner, every authorized company shall annually file with the commissioner, with the NAIC, or with a statistical agent designated by the NAIC and acceptable to the commissioner, statistical reports showing mortality, morbidity, policyholder behavior, and expense experience, and other data necessary to value all the types of life insurance in which it does business, and such other information as the commissioner may deem necessary or expedient for the administration of the provisions of this regulation. The form of the reports shall be established by the commissioner or the commissioner may require the use of a form established by the NAIC or by a statistical agent designated by the NAIC and acceptable to the commissioner.~~

~~B.   Statistical agent means an entity with proven systems for protecting the confidentiality of individual insured and company information; demonstrated resources for and history of ongoing electronic communications and data transfer ensuring data integrity with insurers companies, which are its members or subscribers; and a history of and means for aggregation of data and accurate promulgation of the experience modifications in a timely manner.~~

Drafting Note: Related issues to be ironed out include the confidentiality of the company's experience and an infrastructure that can be put in place to properly handle the data that is being submitted. Also, if this requirement is included in the Standard Valuation Law, then this section can be removed.

Section 10.   **Effective Date**

  A. The method defined by this regulation affects all policies issued on or after [insert date]. For reinsured policies, the effective date is the original issue date of the policies reinsured, regardless of the effective date of the reinsurance.

Drafting Note: The NAIC Life and Health Actuarial Task Force needs to determine the effective date and transition rules regarding application to this approach. Possible transition rules include limiting the application of this methodology to all in force policies or policies issued after a certain date and establishing a grade in period from current reserve levels to those under this methodology.

  B. Transitional rules for reinsurance.

Drafting Note: It is expected that principles-based reserves will be adopted by all U.S. life companies for products within the scope on a uniform date. If there is uneven adoption of principles-based reserves, then some relaxation of this concept until adoption is complete should be considered by the NAIC, based on administrative considerations. This could be done by establishing special transitional rule for situations where the ceding and assuming companies are subject to different effective dates or different reserve requirements. When principles-based reserving methods are applied to all life products, then this section will no longer be needed.

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ACTUARIAL GUIDELINE PBR-VAL
DETERMINING VALUATION ASSUMPTIONS FOR PRINCIPLES-BASED LIFE INSURANCE PRODUCTS

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Table of Contents

Drafting Note: It may be that some of the material presented in this document would be better placed or restated in an Actuarial Standard of Practice (ASOP). The American Academy of Actuaries' Life Reserves Work Group (LRWG) has been in contact with the Actuarial Standards Board (ASB) to discuss the need for one or more ASOPs to complement this effort. While the right to issue Actuarial Standards of Practice and to determine their content rests exclusively with the ASB, we anticipate that the ASB will be willing to work cooperatively with the work group and the NAIC to develop appropriate ASOPs to support principles-based reserving.

I. **Purpose**

  A. Purpose. The purpose of this Actuarial Guideline is to specify the requirements and methods to establish valuation assumptions used to determine reserves for policies subject to the Principles Based Reserves for Life Products Model Regulation (referred to throughout this document as the "Model Regulation.").

Valuation assumptions for Individual Life Policies, supplemental benefits, and riders on these policies that are not directly identified in the scope are to be determined on a basis that is consistent with the principles and methodologies defined in this Guideline.

B.   The company is expected to provide the Qualified Actuary with the necessary information sufficient to permit the actuary to fulfill the responsibilities set forth in this Guideline and responsibilities arising from applicable guidelines and Actuarial Standards of Practice.

II.   Definitions

Drafting Note: Add definitions from PBR – Model Regulation when finalized.

A.   Credibility Adjusted Mortality Table. The set of mortality rates resulting from the credibility procedure described in Subsection IV to blend company experience mortality rates with the Industry Mortality Table rates,

B.   Industry Mortality Table. An NAIC approved mortality table (without valuation margins) used for credibility weighting purposes to blend with the company's experience mortality rates when the company's experience is less than 100% credible.

C.   Mortality Segment. A group of Policies used as the basis for a company's mortality experience studies.

D.   Subcategory. A subset of policies within each Mortality Segment used for credibility weighting purposes, based on such things as gender, age, duration, and risk class.

E.   Subcategory Credibility Factor. For each subcategory of each Mortality Segment, a factor used to determine the credibility adjustment for mortality as described in Subsection IV.D.4.(a).

F.   Total Credibility Factor. For all policies in each Mortality Segment, a factor used to determine the credibility adjustment for mortality as described in Subsection IV.D.4.(a).

G.   Valuation Mortality Table. An NAIC approved mortality table (with valuation margins) that is to be used as the Prudent Best Estimate Assumption for mortality following the process defined in Subsection IV.

III.   General Considerations

A.   Deterministic Reserve Valuation Assumptions. All valuation assumptions used in the Deterministic Reserve that are not prescribed shall be based on Prudent Best Estimates. Prescribed Deterministic Reserve assumptions include:
1.   Interest Rate movements (i.e., Treasury interest rate curves);
2.   Net Spreads (net of default costs and investment expenses) over Treasuries for Reinvestment Assets;
3.   Equity performance (i.e., S&P 500 returns and other returns of other equity investments).

B.   Stochastic Reserve Valuation Assumptions. All valuation assumptions used in the Stochastic Reserve calculation that are not 1) prescribed or 2) modeled stochastically shall be based on Prudent Best Estimate Assumptions.
1.   Unless stated otherwise, Prudent Best Estimate assumptions used in the Stochastic Reserve shall be the same as those used in the Deterministic Reserve.
2.   Prescribed assumptions include net spreads (net of default costs and investment expenses) over Treasuries for reinvestment Assets.
3.   Risk Factors that are required by the Model Regulation to be modeled stochastically are:
a.   Interest Rate movements (i.e., Treasury interest rate curves)
b.   Equity performance (i.e., S&P 500 returns and returns of other equity investments)
4.   The actuary may elect to stochastically model other Risk Factors in addition to the Risk Factors listed in 3 above. If so elected, the requirements in the Guideline for determining Prudent Best Estimates for the Risk Factor would not apply.

C.   Granularity Considerations.

1. ~~In establishing valuation assumptions, the actuary shall choose between setting a separate assumption specific and appropriate to each individual policy being valued, a single assumption to be applied to all policies being valued, or an assumption with some degree of granularity within these two endpoints. In making that choice, the actuary shall balance the volume of work in establishing a separate assumption specific and appropriate to each individual policy against the possible loss of precision and appropriateness in applying an assumption over a broader group of policies. For example, the application of a single assumption for premium payment patterns over a group of policies may lead to the unintended premature cessation of projected benefits.~~

2. ~~The actuary shall estimate and disclose the effect of the choice of granularity in the Actuarial Report. The appropriate degree of granularity in the assumptions will be determined by the sensitivity of the results to different levels of granularity. Assessing the acceptability of the level of granularity and estimating the effect of a less granular model may be performed on a date other than the Projection Start Date, and need not be updated every year, unless the actuary determines that such an update is appropriate.~~

~~Drafting Note~~: ~~Further guidance on assessing the acceptability of the level of granularity may be provided by an ASOP, subject to approval by the ASB.~~

D. ~~CTE Level. The Stochastic Reserve is based on a <<insert risk level>> CTE (Conditional Tail Expectation) level, which is determined by taking the numerical average of the <<insert 1 minus the risk level>> percent largest values of the Scenario Reserves.~~

~~Drafting Note~~: ~~The NAIC Life and Health Actuarial Task Force (LHATF) will need to establish the CTE risk level.~~

Subsection 7~~IV~~. ~~Specific Guidance and~~ Requirements for Setting Mortality Assumptions

A. Background

1. The Valuation Mortality Rates used in the reserve calculation will equal the current Commissioners' Standard (CS) Mortality Table for the class of business being valued based on company experience, adjusted for the credibility of this experience as described below and further adjusted with a ~~Margin~~Margin. The approach described in this Section shall be followed to determine the Valuation Mortality Table and used as the ~~Prudent Best Estimate~~Prudent Estimate mortality assumption for the ~~Deterministic Reserve~~Deterministic Reserve and the ~~Stochastic Reserve~~Stochastic Reserve.

2. The following terms shall have the indicated meanings for purposes of this Subsection:

   a. Credibility Adjusted Mortality Table. The set of mortality rates resulting from the credibility procedure described in Subsection ~~IV~~7(D)(4) to blend company experience mortality rates with the Industry Mortality Table rates,

   b. Industry Mortality Table. An NAIC approved mortality table (without valuation margins) used for credibility weighting purposes to blend with the company's experience mortality rates when the company's experience is less than 100% credible.

   c. Mortality Segment. A group of Policies used as the basis for a company's mortality experience studies.

   d. Subcategory. A subset of policies within each Mortality Segment used for credibility weighting purposes, based on such things as gender, age, duration, and risk class.

   e. Valuation Mortality Table. An NAIC approved mortality table (with valuation margins) that is to be used as the Prudent ~~Best~~ ~~e~~Estimate Assumption for mortality ~~following the process defined in Subsection IV~~.

B. Overview

38

1.　　　A Mortality Segment is defined as a grouping of policies used to determine experience mortality rates. The actuary may define one Mortality Segment to include all policies subject to these requirements ~~regulation~~, or may define multiple Mortality Segments for subsets of policies.

2.　　　 The actuary shall determine the Valuation Mortality Table for each Mortality Segment (or subcategory of each Mortality Segment, as described below) by applying steps a~~1~~ to e~~5~~ below.

　　　a.~~1~~.　　Using the guidance and requirements specified in Subsection 7C below, develop experience mortality rates based on either a company's own available experience or other relevant experience.

　　　b~~2~~.　　Blend the experience mortality rates with an Industry Mortality Table as provided in Subsection 7D below to reflect their level of credibility of the mortality experience. Mortality improvement may be reflected up to, but not beyond, the ~~Projection Start Date~~Projection Start Date.

Drafting Note: There are two types of tables which the NAIC will need to approve for use. The first are CS tables. These are Valuation Tables that include valuation m~~M~~argins. The second are Industry Mortality Tables~~, and the associated adjustments.~~ ~~These tables~~ that reflect experience prior to the addition of m~~M~~argins. Industry Mortality Tables are used to ~~to~~ select the Valuation Mortality Table to be used.

　　　c~~3~~.　　Adjust the credibility adjusted mortality rates in step b~~2~~ to include a ~~Margin~~Margin as provided in Subsection 8E.

　　　d~~4~~.　　~~────~~Adjust the rates produced in step c~~3~~ for impaired lives or to reflect any reasonable expectation that policyholder behavior will lead to mortality results which vary from underlying mortality table as determined in step c~~3~~. An example of the latter would be increased mortality due to high lapses following a significant increase in policyholder costs. Subsection 7F below provides guidance and requirements for making these adjustments.

Drafting Note: Steps c~~3~~ and d~~4~~ assume that the CS tables are constructed by applying an appropriate margin formula to the weighted average of a set of Industry Mortality Tables, with each Industry Mortality Table reflecting the mortality of a specified risk class. If the procedure ultimately adopted for the construction of the CS table is different than assumed, Steps c~~3~~ and d~~4~~ should be appropriately revised.

　　　e~~5~~.　　Choose the Valuation Table that produces an aggregate Seriatim Reserve closest to, but not less than, the aggregate Seriatim Reserve calculated using the adjusted experience mortality rates produced in step d~~4~~, as provided in Subsection 7G.

C.　　Determination of Experience Mortality Rates

1.　　Actual Experience Data:

　　　a.　　In determining experience mortality rates the actuary shall use the company's actual experience data directly applicable to the business segment (i.e., the company's actual data) if it is available. If the company's directly applicable experience data is not available, then the company may use data other than directly applicable experience as described in paragraph 2 below. Finally, if there are no data, the actuary shall use the applicable Industry Mortality Table, as defined in subsection 7D.2 below.

　　　b.　　The company's actual directly applicable experience data shall be measured and updated every 3 years, or more frequently based on company practice. Whenever experience data are updated, the actuary shall reflect changes in experience promptly once changes have been determined to be significant, and are expected to continue into the future. More frequent updates of experience data may be prudent for newer blocks of business or blocks of business with greater uncertainty.

c. The following shall apply when using the company's directly applicable experience:

(i)a. Actual experience data may be determined by individual risk class or aggregated for multiple risk classes. The latter would typically result in higher overall credibility for the study. The Industry Mortality Table rates must be consistent with the choice of aggregation. Once a method is chosen the actuary may change the methodology (or parameters used in the methodology) for aggregating experience, but must disclose the rationale and the impact on reserve levels of such change.

(ii)b. It is permissible to group experience by issue age group, gender, risk class and policy duration. Grouping by issue age groups can be no broader than 10-year age groupings. Grouping by policy duration can be no broader than 5 years. The purpose is to use a company's experience when significant, yet require the use of industry experience where little or no experience exists.

Drafting Note: Further guidance may be given in an ASOP regarding how to determine these groupings, subject to approval by ASB.

2. Using other than Directly Applicable Actual Experience.

a. If experience mortality rates for a business segment are being determined using data consistent with the business segment, but is not based on the actual experience directly applicable to the business segment (whether or not the business segment is from the company), the actuary shall document any similarities or differences between the two business segments (e.g., type of underwriting, marketing channel, average policy size, etc.). For an actuary to use other than directly applicable actual experience, only rates developed through direct measurement of mortality data may be used. Rates developed from extrapolation of other mortality data or studies may not be used. For example, if mortality data has been developed with extrapolated rates beyond a certain age, this portion of the data may not be used in developing the actuary's experience mortality rates.

b. Additionally, the actuary shall document the following:

(i)a. Source of data including a detailed explanation of the appropriateness of the data, the underlying source of data, including how the mortality rates were developed, graduated and smoothed.

(ii)b. The number of deaths and death claim amounts by major grouping no broader than those allowed for direct company data and including: age, gender, risk class, policy duration and other relevant information.

3. No Experience Data Exists: In the situation were little or no experience exists, the experience mortality rates shall be set to the Industry Mortality Table rates appropriate for the underlying business reflecting the underwriting associated with the risk classes.

4. Adjustments to Experience Data:

a. The actuary may also reflect the effects of risk selection and underwriting practices not reflected in the underlying experience when supported by relevant published medical and clinical studies.

b. The following conditions must be met when making such adjustments:

(i)a. The actuary may only reflect the effectiveness of such risk selection and the anticipated incremental benefits over prior risk selection techniques. The actuary must disclose the rationale and support for the adjustment.

40

(ii)~~b.~~　The actuary may not use a study unless the actuary has reviewed the underlying techniques used to develop the study and concluded that the study is appropriate for use. The actuary must disclose the rationale used to reach this conclusion.

(iii)~~e.~~　Any adjustment must be approved for use by the commissioner.

Drafting Note: It is anticipated that such adjustments 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 Guideline requires that~~ the commissioner shall determine the level of documentation or analysis that would be required to approve such adjustments. The NAIC may want to consider whether approval by a centralized examination office would be preferable to approval by the commissioner.

D.　Adjustment for Credibility

1.　The Industry Mortality Table to be used for credibility weighting is defined as the 2001 VBT table (or other tables adopted by the NAIC for this purpose) adjusted in a manner approved for use by the NAIC to reflect the most recent Society of Actuaries intercompany study approved for use by the NAIC, adjusted for mortality improvement from the effective date of the Industry Mortality Table to the experience weighted average date underlying the data used to develop the experience mortality rates.

Drafting Note: It is anticipated that the NAIC will adopt sets of rates reflecting a range of underwriting criteria associated with the Industry Mortality Table. Also, this approach requires the NAIC to periodically approve a set of mortality improvement factors. Currently, there are no such approved factors.

2.　~~Selection of~~Industry Mortality Table ~~rates.~~ The Industry Mortality Table rates have the presumption of being 100% credible. As such, the method used to identify the Industry Mortality Table rates for credibility weighting shall be prescribed.

Drafting Note: The Joint American Academy of Actuaries/Society of Actuaries preferred mortality group is developing a methodology which, once finalized will be incorporated into ~~the guideline~~these requirements to facilitate the selection of the appropriate Industry Mortality Table rates. It is anticipated that for a given Industry Mortality Table there will be sets of rates reflecting a range of underwriting criteria as well as the methodology for selection of the Industry Mortality Table rates. It is anticipated that Industry Mortality Table rates may be selected for each risk class, or at the option of the actuary, Industry Mortality Table rates may be selected for individual or combinations or risk classes. The latter approach would typically be used when the company experience data has been compiled by combined risk class.

3.　~~Adjustment for Credibility:~~ The experience mortality rates determined in ~~S~~subsection 7(C) above shall be adjusted based on the full or partial credibility of the experience data used to determine the rates in order to arrive at credibility adjusted experience mortality rates. The adjustment for credibility shall result from blending the experience mortality rates with the Industry Mortality Table.

~~4.　Credibility Procedure: The statistical credibility of internal mortality data decreases as the number of sub-categories of the internal data increase. For example, a table based on aggregation of all experience from a block of business is more credible than one that breaks down experience by gender, duration or underwriting class. Credibility factors must be applied to the aggregated internal data, as well as reflecting weighting to subcategories.~~

4.　Credibility Procedure

a.　The actuary shall apply a credibility methodology appropriate for the business being valued for the portion of the mortality segment where data exists. This credibility procedure shall meet the following requirements:

(i)　Full credibility measure shall be established which provides in the aggregate an X% probability of being correct within a Y% Margin of error.

(ii) The credibility methodology is recognized by the actuarial profession as acceptable practice as provided for in published transactions and scientific journals subject to professional peer review.

(iii) The methodology should address application of partial credibility.

(iv) The actuary must also define subcategories of policies within each mortality segment for credibility weighting purposes, based on criteria such as gender, age, duration, and risk class. Each subcategory can be no broader than 10-year age groupings. Grouping by policy duration can be no broader than 5 years.

b. The actuary shall disclose the credibility methodology used and include in this disclosure how partial credibility was applied to subcategories and discuss the appropriateness of the credibility procedure. To the extent the actuary has changed the credibility methodology (or procedures and values for determining partial credibility) from the prior Valuation Date, the actuary must disclose the rationale for the change and quantify the impact on the Reported Reserve of the change.

A Total Credibility Factor will be determined for each Mortality Segment, as defined below.

The actuary must also define subcategories of policies within each Mortality Segment for credibility weighting purposes, based on such things as gender, age, duration, and risk class. Each subcategory can be no broader than 10-year age groupings. Grouping by policy duration can be no broader than 5 years. A Subcategory Credibility Factor will be determined for each subcategory of policies, as defined below.

The credibility procedure used shall be based on a Poisson Distribution with a 90% probability of being correct within a 5% margin of error. Using this definition, the number of claims needed for full credibility by number of policies is 1083 prior to a required adjustment for the distribution of face amounts. The number of claims needed for full credibility reflecting the face amount distribution is (1083) times the factor "F," where, "F" equals one plus (the standard deviation of face amounts divided by the average face amount)^2. "F" will vary for each segment of business being evaluated. The credibility weighting factor for experience mortality data is found by taking the square root of (N/nnn) times the factor F, where N is the number of deaths in the underlying experience mortality study and nnn is the number of deaths representing full credibility.

The Total Credibility Factor is determined by the calculation described above for the policies in each Mortality Segment, where N is defined as the number of deaths in the Mortality Segment. Each Subcategory Credibility Factor is determined by the calculation described above for the policies in each subcategory within each Mortality Segment, where N is defined as the number of deaths in each subcategory with each Mortality Segment.

Drafting Note: The NAIC must specify the factors X and Y above for the probability of being correct and the margin of error respectively. The numbers above are included to engage discussion. Also, discussions around the credibility methods continue and may result in additional changes. The LHATF may wish to consider allowing other credibility methods, in particular a credibility method based on exposures rather than claims. The NAIC may wish to require state of domicile approval for any change in credibility method.

a. To determine the Credibility Weighted Mortality Table for each Mortality Segment, the actuary shall perform the following steps (this approach is based on the Normalized Approach as described in the Canadian Institute of Actuaries' Educational Note, *Expected Mortality: Fully Underwritten Canadian Individual Life Insurance Policies*, July 2000, section 550, page 18.):

i. Identify the appropriate Industry Mortality Table rates as described in Subsection IV.D(2) above.

ii.   Use experience mortality data to determine the Mortality Segment A/E (actual to expected) based on amounts insured, where the Industry Mortality Table rates are used as the expected basis.

iii.   Determine the Total Credibility Factor for each Mortality Segment as described above.

iv.   Calculate the blended expected mortality ratio for each Mortality Segment, equal to [(1) x (2)] + (3), where:

      (1)   equals the Total Credibility Factor as determined in step iii above;

      (2)   equals the Mortality Segment A/E ratio as determined in step ii above; and

      (3)   equals one minus the Total Credibility Factor.

v.   Calculate the blended expected claim amount for each Mortality Segment equal to (1) x (2) where:

      (1)   Equals the blended expected mortality ratio for each Mortality Segment as determined in step iv above; and

      (2)   Equals the expected claims for the Mortality Segment using the Industry Mortality Table rates.

vi.   For each Subcategory of policies within each Mortality Segment, use experience mortality data to determine Subcategory A/E ratios based on amounts insured, where the Industry Mortality Table rates are used as the expected basis.

vii.   For each Subcategory of policies, calculate the Subcategory Credibility Factor as described above.

viii.   For each Subcategory of policies, calculate the blended expected mortality ratio equal to (1) x (2) + (3) where:

      (1)   equals the Subcategory Credibility Factor as determined in step vii above;

      (2)   equals the Subcategory A/E ratio as determined in step vi above; and

      (3)   equals one minus the Subcategory Credibility Factor.

      For any Subcategory with no experience, the Subcategory blended expected mortality ratio is set equal to one.

ix.   For each subcategory calculate the Subcategory blended expected claim amount, which equals (1) x (2) where:

      (1)   Equals the Subcategory blended expected mortality ratio as determined in step viii above and

      (2)   Equals the expected claims for the Subcategory using the Industry Mortality Table rates.

x.   Calculate the total Subcategory expected claim amount as the sum of each subcategory expected claim amount determined in step ix above for each subcategory.

xi.   Determine the normalized Subcategory A/E ratios as (1) x (2)/(3) where:

c.b. In developing credibility adjusted mortality rates, the actuary shall grade ~~The actuary may smooth~~ the ~~results in step xii above such that~~ mortality rates to the industry mortality table rates over a period of time, with the period of time determined by the actuary. It is permissible to grade beyond the portion of the mortality segment where data exists. The grading must be ~~they are~~ reasonable in the professional judgment of the actuary and consistent with accepted actuarial practice. ~~The actuary must document any grading ~~smoothing~~ adjustments made. When making such grading ~~smoothing~~ adjustments, the actuary must take into account ~~both~~ the level of partial credibility, the trend in actual to expected ratios, ~~aggregate claims and~~ the shape and level of the resulting mortality rates, and the reasons for differences in mortality results relative to industry mortality rates due to underwriting, market, selection and other factors~~.~~

Drafting Note: Further discussion and analysis is needed to determine whether the grading period should be prescribed using a straight line grade-in over "n" years rather than being determined by the actuary.

d.c. The actuary may separate the cCredibility aAdjusted mMortality rates by risk class by developing separate mortality rates for each risk class. In doing so, the actuary must disclose the underwriting differentials used by class and must conserve the total number of deaths in the aggregate. For practical purposes and for consistency across companies, lapses and surrenders shall be ignored in this process.

Drafting Note: Further guidance on how to split the Credibility Adjusted Mortality Table rates by risk class is needed.

e.d. The cCredibility-aAdjusted mMortality ~~Table~~ rates must be further adjusted for mortality improvement up to the ~~Projection Start Date~~Projection Start Date based on applicable published industry-wide experience when such adjustment increases the ~~Reported Reserve~~Reported Reserve. An adjustment may be made for mortality improvement up to the Projection Start Data based on applicable published industry-wide experience when such adjustment decreases the ~~Reported Reserve~~Reported Reserve. The adjustment made shall be for the period from the experience weighted average date underlying the company experience used in the credibility process to the ~~Projection Start Date~~Projection Start Date.

f.e. ~~The set of rates after applying the adjustments in Subsection D4 (b),(c) and (d) above is defined as the Credibility Adjusted Mortality Table.~~

5. Any adjustment for mortality improvement shall not be allowed beyond the ~~Projection Start Date~~Projection Start Date unless such an adjustment would serve to increase the resulting ~~Reported Reserve~~Reported Reserve.

g. The set of rates after applying the adjustments in Subsection 7D(4) (b),(c) and (d) above is defined as the Credibility Adjusted Mortality Table.

E. Margins

1. The Credibility Adjusted Mortality Table rates are adjusted by adding a Margin.

The Margin shall be expressed as a constant divided by the curtate expectation of life, where the curtate expectation of the life is calculated without the expectation of future mortality improvements. This constant can vary by business segment or policy type due to differences in benefits or policyholder behavior.

Drafting Note: The choice of only allowing a single constant is to provide one framework to facilitate the review of the Margin by regulators and peer reviewers.

2.. To develop the Margin, the actuary shall perform sensitivity testing of reserve levels to changes in the underlying mortality assumption.

3. The method and factors used to determine the Margin shall be consistently applied on each ~~Valuation Date~~Valuation Date. Any changes in the method or factors used shall be documented, including the reason for the change.

4. When setting the Margins, the actuary shall consider applying a higher Margin~~s~~ to the experience mortality rates in situations of uncertainty including but not limited to the following:

a~~1~~. The credibility of the company's experience studies is low.

b~~2~~ The underwriting or risk selection risk criterion have changed.

c~~3~~. There is a lack of homogeneity of in the underlying data being used.

d~~4~~. Unfavorable environmental or health developments are unfolding and are expected to have a material and sustained impact on the insured population.

e~~5~~. Anti-selection occurs by the sales force or secondary markets.

f~~6~~. Constraints in the modeling of the liability limit an effective reflection of mortality risk.

F. Additional Adjustment to the Credibility Adjusted Mortality Table rates.

1. Credibility Adjusted Mortality Table rates shall be adjusted to reflect the mortality differences associated with impaired lives or mortality differences due to policyholder behavior not reflected in the underlying experience. These include adjustments for policy provisions or policyholder behavior that suggest mortality anti-selection.

2. Examples of the types of items for which the actuary must consider an adjustments include: term conversions, table shave programs, level of premiums and changes in premium patterns, exchange programs, and high withdrawal rates to the extent not reflected in the underlying experience. These adjustments will typically be made within the projection since the adjustments may vary by Scenario.

3. Such adjustments to the Credibility Adjusted Mortality Table rates may only be made if the ~~Reported Reserve~~Reported Reserve is equal to or greater than the ~~Reported Reserve~~Reported Reserve assuming no adjustment was made.

G. Valuation Mortality Assumption

1. The Valuation Mortality Table shall be the most recent Commissioner's Standard Table.

Drafting Note: For Principles-Based reserves, the valuation mortality rates should closely reflect company experience to the extent credible. Given the large number of risk classes available on current life insurance products and qualification and underwriting requirements that vary significantly by company, having sub-tables of a Commissioner's Standard Table which provide for varying company experience is preferred.

Only a single sub-table will be used for all issue ages and durations within a defined block of business segment. However, different sub-tables may be used for each block of business segment such as gender, risk class, plan type.]

2.   The Valuation Mortality rates (or sub-table rates) which results in the sum of the Seriatim Reserves being closest to, but not less than the sum of the Seriatim Reserves using the Credibility Adjusted Mortality rates determined in Subsection F with all other assumptions the same. The determination of the Valuation Mortality Table rates (or sub-table rates) to be used shall be updated at least once every three years or more often if significant changes to the Credibility Adjusted Mortality Table were made.

H.   "Best EstimateAnticipated eExperience" Mortality Assumption for the Purpose of Margin Disclosure Amount

The Regulation This Section requiress the disclosure of Margins for each material Risk Factor and in the aggregate. For purposes of these disclosures the "Abest estimatenticipated Experience" mortality Aassumption for mortality will be set equal to the Credibility Adjusted Mortality Table rates determined in Subsection 7F above without the Margins determined in Subsection 7E above and reflecting future mortality trends beyond the Projection Start DateProjection Start Date not to exceed 1.00% improvement per year through age 60, grading linearly to zero by attained age 85.

Drafting Note: The 1.00% prescribed cap on mortality improvement to determine the Margin disclosure amount needs further discussion and analysis.

Subsection 8V.   Guidance and Requirements for Setting Policyholder Behavior Assumptions

A.   Best EstimateAnticipated Experience Policyholder Behavior Assumptions

Drafting Note: Guidance on setting best estimate assumptions may be provided in an ASOP.

1.   Anticipated Experience Assumptions for policyholder behavior shall be consistent with relevant and credible past experience and reasonable future expectations.General Considerations.

2.   The actuary shallould develop Aanticipated Experience Assumptions for policyholder behavior Risk Factors that include, assumptions for the Cash Flow Models including but are not limited to, assumptions for premium payment patterns, premium persistency, surrenders, withdrawals, allocations between available investment or crediting optionstransfers between fixed and separate accounts on variable products, benefit utilization, and other option elections.

3.   The Anticipated Experience AWhen establishing these assumptions, the actuary should consider that anticipated policyholder behavior ssumptions for policyholder behavior shall reflect the actuary's expectation regarding variations in anticipated policyholder behavior relative may be expected to vary according to such characteristics such as gender, attained age, issue age, policy duration, time to maturity, tax status, level of account and cash value, surrender charges, transaction fees or other policy charges; distribution channel, product features and whether the policyholder and insured are the same person or not.

4.   The actuary shall develop Aanticipated Experience policyholder behavior Aassumptions for policyholder behavior that are appropriate for the block of business being valued, giving . The actuary shall give due consideration to other assumptions used in conjunction with the Cash Flow Model of the valuation model and to the Scenarios whose results are likely to contribute to the Reported ReserveReported Reserve when deriving anticipated policyholder behavior.

5.   The actuary shall use actual experience data directly applicable to the block of business being valued (i.e. direct data) if it is available. In the absence of directly applicable data, the actuary should next use available data from any other block of business that is similar to the block of

46

business being valued, whether or not that block of business is directly written by the company. If data from a similar block of business is used, the Anticipated Experience Assumption shall be adjusted to reflect material differences between the business being valued and the similar block of business. The actuary shall document any significant similarities or differences between the two blocks of business, the data quality of the experience data used, and the adjustments applied.

6. ~~The actuary should not constrain a~~Anticipated Experience ~~policyholder behavior~~ Assumptions for policyholder behavior shall reflect ~~to~~ the outcomes and events exhibited by historical experience only to the extent such ~~when that~~ experience is ~~not~~ relevant to the risk ~~product~~ being modeled. The actuary sh~~all~~~~ould~~ determine the extent to which ~~whether~~ recent historical experience is relevant for the risk being modeled ~~current models,~~ especially when modeling policyholder behavior of a new product benefit or feature.

7. The actuary may ignore certain items that might otherwise be explicitly modeled if the inclusion of such items would not have a significant effect on the results.

8~~2~~. ~~Options. Options embedded in the product, for example, term conversion privileges or policy loans, may impact policyholder behavior. The actuary should consider that as the value of a product option increases, there is an increased likelihood that policyholders will behave in a manner that maximizes their financial interest in the contract (e.g., lower lapses, higher benefit utilization, etc.). The actuary may ignore options that are not significant drivers of results.~~
Anticipated Experience Assumptions for policyholder behavior shall reflect the likelihood that policyholder behavior will be affected by any significant increase in the value of a product option, such as term conversion privileges or policy loans.

9~~3~~. Lack of Relevant and/or Credible Data.

a. ~~Unless there is clear evidence to the contrary, anticipated policyholder behavior assumptions should be consistent with relevant and credible past experience and reasonable future expectations. At any duration for which~~ When relevant and/or fully credible data do not exist, the actuary should determine what action will maximize the financial value of the policy from the point of view of the policyholder (i.e. lapse the policy, persist, take out a loan, etc.).

b. The actuary sh~~all~~~~ould~~ then use judgment to estimate the percentage of policyholders who will take that action. The actuary shall assume ~~Since~~ some policyholders will~~may~~ act to maximize the financial value of the policy and shall, therefore, assume this ~~the actuary should not assume this~~ percentage is greater than zero. Conversely, if in the actuary's judgment, ~~However, since~~ some policyholders may place value on factors other than maximizing the policy's financial value (for example, convenience of level premiums, personal budget choices, etc.) and since the policy's full economic value to the policyholder depends, in some cases, ~~not only on its currently realizable value but also~~ on factors not available for analysis (such as the health of the insured and the financial circumstances of the beneficiaries and policyholder, including their tax status) ~~it is also reasonable for~~ the actuary may~~to~~ assume that the percentage is less than 100.

Drafting Note: When there are no relevant, credible data available, the NAIC may want to prescribe an assumption for this percentage.

c. In establishing an assumption the actuary should test the sensitivity of results to understand the materiality of making alternate assumptions.

10~~4~~. Dynamic Assumptions.

a. The actuary sh~~all use a~~~~ould exercise care in using static assumptions when it would be more natural and reasonable to use a~~ dynamic model or other scenario-dependent formulation for anticipated policyholder behavior unless the behavior can be appropriately represented by static assumptions.

b.   Risk factors that are modeled dynamically should encompass the reasonable range of future expected behavior consistent with the economic scenarios and other variables in the model.

c.   In the absence of evidence to the contrary, it is not necessary to model extreme or "catastrophic" forms of behavior. However, the actuary should test the sensitivity of results to understand the materiality of making alternate assumptions.

B.   Best Estimate Premium Payment Assumption

1.   An important element of the Cash Flow Model is the set of assumptions about the amount of premium to be paid in each future period on policies remaining inforce, and assumptions about premium persistency, the probability that a premium will be paid in a particular period. While historical experience, when available, is often a good basis for such assumptions, the actuary should exercise care about assuming that past behavior will be indefinitely maintained. For example, market or environmental changes can make historical experience less relevant. The actuary should also consider varying premium payment assumptions by interest rate scenario.

2.   The actuary should consider the desirability of making multiple premium payment assumptions, by subdividing the cell of business into several projection cells, each with a separate payment pattern assumption. If this is not done, and the actuary decides to use one average pattern for the cell, the actuary should consider making use of sensitivity testing, which may help to determine whether the estimates of reserves or risks are significantly impacted by the use of such an approach.

3.   For policies with fixed future premiums, the actuary should assume that future premium payments on inforce policies will be in accordance with the policy provisions. In other situations, the actuary, in formulating assumptions about future premium payments, should consider taking into account such factors as the limitations inherent in the policy design, the amount of past funding of the policy, and the marketing of the policy. Marketing factors that may lead to low premium payments include:

- Marketing emphasis on coverage (as opposed to savings accumulation);

- Marketing emphasis on premium flexibility; or

- Illustrations featuring quick-pay premiums.

Marketing factors that may lead to high premium payments include:

- Marketing emphasis on savings accumulation or tax advantages;

- Pre-authorized transfers; or

- Bonuses for higher premiums or assets.

4.   In selecting multiple premium patterns for modeling purposes, the actuary may consider using one or more of the following patterns: target premium, illustrated premium, billed premium, minimum premium, and/or continuation of past premium levels.

C.   Best Estimate Allocation Assumption. The actuary shall set an assumption for the allocation of premiums and account balances among fixed, indexed or separate accounts of indexed or variable products.

When premiums may be allocated between fixed, indexed or separate accounts of indexed and/or variable products, the future premiums and allocations assumed among available accounts may produce significant differences in liabilities for different assumptions. The actuary should use sensitivity testing to understand the importance of this assumption and follow the guidance provided in Subsection V.F.below

D.   Best Estimate Partial Withdrawal and Surrender Assumptions

1. The actuary should use a dynamic model for partial withdrawal and surrender assumptions reflecting factors such as the projected interest rate environment, funding level, premium increases, and benefit triggers when it would be more appropriate than using a static assumptions.

2. In setting partial withdrawal and surrender assumptions, the actuary should consider the insured's age and gender, and the existence of surrender charges. In addition, the actuary should consider taking into account such factors as the policy's competitiveness, surrender charges, interest or persistency bonuses, taxation status of the policyholder, premium frequency and method of payment, emergence of life settlement and viatical markets, and any guaranteed benefit amounts.

3. The actuary should consider the fact that rates of surrender can decline dramatically prior to a scheduled sharp increase in surrender benefit (sometimes known as a "cliff") caused by a decrease in surrender charge, a bonus or a maturity benefit, and rates of surrender can rise significantly after such an event.

4. Whenever the minimum premium required to keep the policy in force increases substantially, an appropriate shock lapse assumption must be incorporated in the modeling.

5. Whenever the minimum premium to keep the policy in force is zero and the cash surrender benefits are small in relation to the premiums paid, the actuary must assume that there are no surrenders.

B̲E. Margin̲s̲ for s̲—Policyholder Behavior Assumptions

1. Sensitivity testing of assumptions will be required to establish the Margin. These tests should include, but are not limited to, premium payment patterns, premium persistency, surrenders, partial withdrawals, allocations between available investment or crediting options̲transfers between fixed and separate accounts,̲ benefit utilization, and other option elections.

2. Unless there is clear evidence to the contrary, Margins for policyholder behavior assumptions shall increase over time as it is prudent to assume that the risk of policyholders taking actions that increase the company's liability will increase over time.

3. Where relevant and credible empirical data do not exist, the actuary shall adjust the Margin to reflect the increased uncertainty such that the policyholder behavior assumption is at the conservative end of the plausible range of expected experience that serves establish a higher Margin in policyholder behavior assumptions to increase the Reported Reserve̲Reported Reserve.

4. In order to ensure that the Margin increases the Reported Reserve̲Reported Reserve, the choice between addition and subtraction may need to vary by scenario̲Scenario, age, policy duration, and other parameters. In the case of partial withdrawal, two assumptions are needed – the amount withdrawn and the partial withdrawal rate.

5. Margins shall reflect the data uncertainty associated with using data from a similar but not identical block of business to determine the Anticipated Experience Assumption.

6. A higher Margin is appropriate for partial withdrawal and surrender assumptions where the company's marketing and /or administrative practices encourages anti-selection.

7̲6. The Margin applied to the withdrawal assumption shall take into account the application of any dynamic behavior adjustment, if such adjustment is made, to have the intended effect. After application of the Margin and any dynamic behavior adjustment the resulting withdrawal assumption should be reasonable (e.g., greater than or equal to zero and less than 100%).

C̲F. Sensitivity Testing.

1.   The actuary is required to examine the sensitivity of results to understand the materiality of making alternate policyholder behavior assumptions on the ~~Reported Reserve~~Reported Reserve. Sensitivity testing may be performed using samples of the policies in force; it is not required that the entire valuation be done for each alternate assumption set. Sensitivity testing may be done using data from prior periods when appropriate.

2.   The actuary should update the sensitivity tests when appropriate, considering the materiality of the results of the tests and trends in experience data. Less frequent updating of these tests is appropriate when the tests show less sensitivity of ~~Reported Reserve~~Reported Reserve to changes in the assumptions being tested or the experience is not changing rapidly.

3.   With respect to policies which give policyholders flexibility in the timing and amount of premium payments, the actuary must examine, but not be limited by the following, premium scenarios:

   a~~1~~.   Minimum premium scenario. At any point in the ~~policy~~Policy's lifetime, the policy provisions define a future stream of future minimum premium payments that will keep the ~~policy~~Policy in force until policy expiry. This pattern of premium payments may depend on the policy design, and could be level or annually increasing or a combination of the two. When the minimum premium is greater than zero, it is reasonable to assume that some policyholders fail to pay the minimum premium, especially when the minimum premium for the current year is greater than the premium actually paid in the prior year. If the minimum premium is increasing substantially compared to the prior year premium, it is reasonable to assume a "shock lapse", for example, where the minimum premium has been zero for a period of years and the next minimum premium is substantial. These non-payment lapse assumptions should be consistent with lapse experience on policies where no nonforfeiture option is available. The actuary shall estimate the impact on the ~~Reported Reserve~~Reported Reserve of assuming that all policyholders pay the minimum premium required by the policy terms to keep the ~~policy~~Policy in force each year.

   b~~2~~.   No further premium payment ~~s~~Scenario   The actuary shall estimate the impact on the ~~Reported Reserve~~Reported Reserve of assuming that no policyholders will pay premiums after the ~~Projection Start Date~~Projection Start Date. In this scenario it is reasonable to assume that some policyholders will withdraw their funds at the ~~Projection Start Date~~Projection Start Date while other policies will lapse or terminate without value according to the terms of their contracts.

   c~~3~~.   Pre-payment of premiums – Single premium ~~s~~Scenario. The actuary shall estimate the impact on the ~~Reported Reserve~~Reported Reserve of assuming that all policyholders will pay all future premiums on the ~~Projection Start Date~~Projection Start Date, to the extent that such pre-payments are permitted under the terms of the policies or by the company's current practices. In this Scenario no non-payment lapses would be assumed. However, if the value of the ~~cash surrender value~~Cash Surrender Value is roughly equivalent to the value of the future death benefits (assuming no further premiums), then it would be reasonable to assume some policyholders will elect to surrender their policies. If the ~~cash surrender value~~Cash Surrender Value is substantially less than the value of the death benefits, as may be the case with policies with secondary guarantees, it would be reasonable to assume that few or none would surrender their policies.

   d~~4~~.   Pre-payment of premiums – Level premium ~~s~~Scenario. Some flexible premium policies may permit the policyholder to pay a level premium that is guaranteed to keep the ~~policy~~Policy in force until the policyholder's death, This premium could be stipulated in the contract or derived from the terms of the contract. The actuary shall estimate the impact on the ~~Reported Reserve~~Reported Reserve of assuming that all policyholders pay level premiums from the ~~Projection Start Date~~Projection Start Date forward in an amount sufficient to keep the contract in force from the ~~Projection Start Date~~Projection Start Date until the insured's death (or as long as possible under the terms of the contract). In this ~~s~~Scenario no non-payment lapses would be assumed.   However, surrenders and withdrawals might occur as described in ~~s~~Scenario (3).

Subsection 9VI. ~~Guidance and~~ Requirements for Setting Expense Assumptions

A.   Requirements for Determining ~~Overview:~~

~~The guidance and requirements in this section apply for setting prudent best estimate expense assumptions used to determine the Deterministic Reserve or Stochastic Reserve.~~

~~B.   Expense Assumption Considerations:~~

~~Below is a list of considerations for the actuary when determining expenses using Prudent Best Estimate Assumption~~Prudent Estimate Assumptions.

1.   The expense assumption sh~~ould~~all reflect all costs associated with the policies being modeled. In other words, the expense assumption should reflect the direct costs associated with the policies being modeled as well as an appropriate portion of indirect costs and overhead (i.e. expense assumptions representing fully allocated expenses should be used.)

2.   Expenses categorized in the annual statement as 'taxes, licenses and fees' (Exhibit 3 of the Annual Statement) sh~~ould~~all be included in the expense assumption.

3.   Acquisition expenses associated with business in force as of the ~~Valuation Date~~Valuation Date and significant non-recurring expenses expected to be incurred after the ~~Valuation Date~~Valuation Date sh~~ould~~all be included in the expense assumption.

4.   Certain information technology development costs and other capital expenditures may be spread over a reasonable number of years in accordance with accepted statutory accounting principles as defined in the Statements of Statutory Accounting Principles (care should be taken with regards to the potential interaction with the considerations above).

5.   Expense assumptions sh~~ould~~all assume that the company is a going-concern.

6.   An appropriate expense basis sh~~ould~~all be chosen that properly aligns the actual expense to the assumption. For example, death benefit expenses should be modeled with an expense assumption that is per death incurred. If values are not significant they may be aggregated into a different base assumption.

7.   In general, expenses sh~~ould~~all reflect the impact of inflation. Expense assumptions for the deterministic and stochastic Scenarios are expected to be the same except for differences arising from application of inflation rates.

8.   Expense assumptions sh~~ould~~all not assume future expense improvements.

9.   Since reserves are calculated on a pre-tax basis assumptions for federal income taxes and foreign income taxes are not required.

10.   Expense assumptions sh~~ould~~all be consistent with other related assumptions. For example, the manner that investment expenses are handled should be consistent with the manner that asset returns are reflected in the model.

B~~C~~.   Methodology to Determine ~~Prudent Best Estimate~~Prudent Estimate Expense Assumptions

1.   ~~Best Estimate: Best Estimate~~Anticipated Experience Assumptions

a.   Anticipated Experience –Assumptions are based on a company's own experience and derived from careful study that is within the range of actuarial practice. Fully allocated expenses should be used, e.g. the expense assumptions should reflect the direct costs associated with the block of policies being modeled as well as indirect costs and overhead costs that have been appropriately allocated to the modeled policies.

Drafting Note: Further guidance may be given in an ASOP, subject to approval by ASB.

ba. ~~Expense Allocations:~~ Expense allocations shall be done in a manner that is within the range of actuarial practice and methodology and that is consistent with applicable ASOPs. The allocation method used shall be consistent across company lines of business. Allocations may not be done for the purpose of lowering the ~~Reported Reserve~~Reported Reserves. Overhead expenses that are allocated to the acquisition function shall be able to be supported by sound actuarial principles and where possible, by company experience.

cb. Significant Expenses due to Non-recurring Events:

    (i) Most significant, non-IT related expenditures are expected to occur prior to the ~~Projection Start Date~~Projection Start Date and would therefore not be included in the reserve calculation. However, there may be some types of non-recurring expenses that are expected to occur beyond the ~~Projection Start Date~~Projection Start Date. An example of this kind of cost would be severance costs anticipated in the next year or legal costs associated with class action suits. These expenses shall~~ould~~ be reflected in the assumption for the future period that they are anticipated to occur.

    (ii) Significant expenses due to IT related investment should follow statutory accounting principles in determining whether or not they should be capitalized. Capitalized expenses should not receive unique treatment according to this methodology. The depreciation of those expenses is reflected in Exhibit 2 of the statement and captured in the validation tool which is used to verify the reasonableness of the expense assumption

    (iii) If there is a unique situation that has occurred whereby significant ~~excessive~~ expenses cannot be reasonably allocated among lines of business, regulatory approval may be sought for a reasonable application of the considerations outlined in ~~S~~subsection 9A~~B~~ above.

de. Mergers & Acquisitions: Only expense efficiencies that are derived and realized from the combination of blocks of business due to a business acquisition or merger shall~~ould~~ be reflected in the expense assumption as long as any costs associated with achieving the efficiencies are also recognized. For example, the combining of two similar blocks of business on the same administrative system may yield some expense savings on a per unit basis, but any future cost of the system conversion should also be considered in the final assumption. If all costs for the conversion are in the past then there would be no future expenses to reflect in the valuation.

2. Margins for Expense Assumptions:

a. A lower Margin may be appropriate where expense assumptions are supported by credible historical company experience or for a line of business that is growing quickly (thereby spreading the fixed costs).

b. A higher Margin is required where:

    a(i). allocation methods create uncertainty regarding line of business splits - especially as it concerns overhead expenses;

    b.(ii) the company's expense experience is not credible;

    c.(iii) the economic outlook is unstable;

    d.(iv) the company's expenses have not been quantified by a study which follows accepted actuarial practice and principles;

<blockquote>
<blockquote>
<p>e.(v)   sensitivity testing determines that the reserve is sensitive to the expense assumption; or</p>

<p>f.(vi)   the regulatory environment is one that creates the likelihood of increased expenses.</p>
</blockquote>

<p>c.   The Margin applied to the expense assumption must be identifiable and may be applied in either the dynamic behavior adjustment or the base assumption as appropriate.</p>
</blockquote>

Subsection 10VII.   ~~Guidance and~~ Requirements for Setting Asset Assumptions

A.   Overview

The ~~guidance and~~ requirements in this Subsection apply for setting valuation assumptions related to the projection of asset cash flows and ~~net investment earnings~~Net Investment Earnings for Starting Assets and reinvestment assets when determining the ~~Stochastic Reserve~~Stochastic Reserve and the ~~Deterministic Reserve~~Deterministic Reserve. Modeling of both general account and separate account assets are addressed, as well as modeling of hedge instruments.

B.   Default Costs and Other Uncertainty in Timing and Amounts of Cash Flows

For both the ~~Stochastic Reserve~~Stochastic Reserve and ~~Deterministic Reserve~~Deterministic Reserve calculations:

1.   Default cost assumptions for the various fixed income asset classes shall~~ould~~ reflect ~~prudent best estimate~~prudent estimates of~~-~~ default costs over a lifetime of the assets and consistent with the type of asset and quality rating. ~~_~~They are subject to the following require~~ments~~d considerations~~:

> a.   The ~~Best Estimate Assumption~~Anticipated Experience Assumption for default cost for a particular asset class shall~~ould~~ take into consideration the company's own experience, to the extent credible and appropriate, and available insurance industry and broad financial market experience. In general, broader market default cost experience ~~should~~shall be a substantial consideration for assets traded in more public and liquid markets.

> b.   As default cost experience is generally observed to be cyclical in nature, ~~Best Estimate Assumption~~Anticipated Experience Assumptions ~~should~~shall be related to historical experience over a period of time long enough to cover both favorable and unfavorable experience years, such that the average historical experience reasonably constitutes an unbiased long-term historical average. The actuary shall generally use a consistent method from one reserve valuation to the next in developing the supporting historical experience.

> c.   If the actuary consolidates quality rating categories for purposes of setting the default cost assumptions, the resulting default costs ~~should~~shall be consistent with those that would have resulted had the more refined recognition of rating categories been used.

> d.   The actuary may use level default cost assumptions over time that are equivalent to the expected default costs over the projected lives of the corresponding assets.

> e.   Default cost assumptions ~~should~~shall be consistent for similar asset classes within both the Starting Assets and reinvestment assets. Inconsistencies may be maintained that arise from adjustments made to comply with any additional requirements herein.

> f.   A Margin shall be added to the ~~Best Estimate Assumption~~Anticipated Experience Assumption applied to each asset class. The actuary shall apply higher Margins (when expressed as a percentage of the credit exposure on the corresponding assets, commonly known as a "basis points charge") in situations of greater uncertainty including but not limited to the following:

<p style="text-align:center">53</p>

      i.   Greater historical variability in the default rates, recovery rates, or both. Generally, the expectation is that lower quality assets will have higher Margins than higher quality assets with similar maturities.

      ii.   Material exposures to newer asset structures that have limited historical experience;

2.   Any uncertainty in the timing and amounts of asset cash flows related to the paths of interest rates█ equity returns, or other economic values contained in the various Scenarios shall be reflected directly in the projection of asset cash flows under the various ~~scenario~~Scenarios within the ~~Stochastic Reserve~~Stochastic Reserve calculation model and under the Deterministic Scenario within the ~~Deterministic Reserve~~Deterministic Reserve calculation model. For example, the impact on cash flows of embedded prepayment, extension, call and put options ~~should~~shall be specifically modeled in a manner consistent with current asset adequacy analysis practice.

C.   Prescribed Net Spreads on Reinvestment Assets

Drafting Note: Further research and analysis is needed to determine these prescribed net spreads. ~~(to be determined)~~.

D.   The Deterministic Scenario

1.   Prescribed U.S. Treasury Interest Rates Path. The path of U.S. Treasury rates used to determine the ~~Deterministic Reserve~~Deterministic Reserve will begin with the market yield curve on the ~~Projection Start Date~~Projection Start Date (based on Treasury yields reported by <<insert source>>). The yield curve 120 months or more after the ~~Projection Start Date~~Projection Start Date will be the "ultimate" yield curve shown below. The yield curve on any date between the ~~Projection Start Date~~Projection Start Date and 120 months after the ~~Projection Start Date~~Projection Start Date will be linearly interpolated between the starting yield curve and the "ultimate" yield curve.

These rates shall be based on the 65 CTE statistic from the distribution of yield curves obtained from the recalibrated C3 Phase I generator (where the CTE is measured at the low end of the distribution of rates). The yield rates shown below for the ultimate yield curve are annual effective rates (not coupon rates or bond-equivalent yields) for a bond with semi-annual coupons.

1yr or less	x%	11	x%	21	x%
2	x%	12	x%	22	x%
3	x%	13	x%	23	x%
4	x%	14	x%	24	x%
5	x%	15	x%	25	x%
6	x%	16	x%	26	x%
7	x%	17	x%	27	x%
8	x%	18	x%	28	x%
9	x%	19	x%	29	x%
10	x%	20	x%	30yrs or more	x%

For example, if the 5-year Treasury rate on the ~~Projection Start Date~~Projection Start Date is 2.85%, and the 5-year ultimate Treasury rate from the above table is 4.05%, then the 5-year Treasury rate assumed in the deterministic ~~scenario~~Scenario would increase by 0.01% each month for 120 months and then level off at 4.05% for the remainder of the projection. The same linear interpolation would be performed for every point on the yield curve.

Drafting Note: The values in the table above will be determined once the re-calibrated C3 P1 interest rate generator is finalized. Further analysis will be needed to finalize the approach used to determine the interest rates at the CTE 65 level once the C3P1 interest rate generator is finalized.

2. Prescribed S&P 500 Returns and Separate Account Fund Performance. The path of equity returns used to determine the ~~Deterministic Reserve~~Deterministic Reserve will be based on a single path of prescribed returns for both General Account equity assets and Separate Account assets. This path will start with the current 10-year Treasury rate as of the ~~Projection Start Date~~Projection Start Date grading to the ultimate 10-year Treasury rate shown in the table in Subsection 11D.1.over 10 years using linear interpolation, with the prescribed spread over 10-year Treasuries (from Subsection 11C above) added to each rate.

E. Stochastic Scenarios

1. Interest Rates Paths. U.S. Treasury rates shall be modeled using:

   a. The American Academy of Actuaries' C3 Phase I interest rate generator, as recalibrated and adopted by the NAIC, or

   b. A prescribed set of <<insert description of pre-packaged interest rate scenarios>>, or

Drafting Note: It is anticipated the LHATF will establish a set of pre-packaged set of interest rate scenarios similar to those used for C3 Phase II RBC requirements.

   c. Proprietary Scenario Sets, or

Drafting Note: If this option is chosen, then the ~~Stochastic Reserve~~Stochastic Reserve will be determined using a prescribed weighting of the ~~s~~Scenarios determined by the company, rather than using the CTE metric. Additional guidance is needed to determinate the how the Proprietary Predetermined Scenario Sets will be established.

   d. An interest rate generator developed by the company as long as the prescribed calibration standards are met.

Drafting Note: It is anticipated that the LHATF will establish calibration standards similar to those used for C3 Phase II.

2. Equity Return Paths. S&P 500 returns and separate account fund performance shall be modeled using:

   a. The << insert prescribed equity return generator and model parameters>>, or

   b. The American Academy of Actuaries' << insert pre-packaged scenarios>>, or

Drafting Note: It is anticipated LHATF will establish a set of pre-packaged set of interest rate scenarios similar to those used for C3 Phase II RBC requirements.

   c. Proprietary Scenario Sets, or

Drafting Note: If this option is chosen, then the ~~Stochastic Reserve~~Stochastic Reserve will be determined using a weighting of the ~~s~~Scenarios determined by the company, rather than using the CTE metric. Additional guidance may be needed to determinate the how the Proprietary Scenario Sets will be established.

   d. An equity return model developed by the company as long as the following prescribed calibration standards are met.

3. Calibration Standards. Interest rate paths and equity return paths used under any of the available choices must meet calibration standards established by the NAIC, except that for Proprietary Scenario Sets, only the full set of Scenarios from which the smaller set is chosen need to meet the calibration standards. The calibration standards are as follows:

<<insert calibration standards or reference to an A~~AA~~cademy report documenting such standards>>

Drafting Note: It is anticipated that LHATF will establish calibration standards similar to those used for C3 Phase II. Although the calibration points in the C3 Phase II requirement only go out 20 years, the requirement provides some guidance for returns beyond 20 years. As the life insurance policies being valued here can have an expected lifetime well in excess of 20 years, LHATF may wish to consider whether this guidance is appropriate for these products. In addition, the pre-packaged scenarios only go out 30 years. As the life insurance policies being valued here can have an expected lifetime well in excess of 30 years, it may be necessary to develop pre-packaged scenarios with a longer time horizon. Alternatively, the existing pre-packaged scenarios could be extended so that they have the same returns as in the first 30 years.

    4.   For considerations as to Other Funds, Correlation of Funds, Number of Scenarios and Efficiency in Estimation, Frequency of Projection and Time Horizon the actuary will use the following:

        <<insert requirements>>

Drafting Note: It is anticipated that LHATF will establish requirements for these items similar to those used for C3 Phase II.

    5.   Integrated Scenarios

Drafting Note: When developing projections for variable products or general account products which are backed in part by equity assets, it will be necessary to project both equity returns and interest rate paths. LHATF may wish to define acceptable methods for integrating these two types of scenarios, and may want to consider approaches similar to those allowed in C3 Phase II.

    F.   "~~Best Estimate~~Anticipated Experience" Assumptions for Risk Factors with Prescribed Valuation Assumptions

        The prescribed "~~best estimate~~Anticipated Experience" A~~a~~ssumptions needed to quantify the impact of Margins required by ~~Sub~~Section 5~~7~~.B(8)~~.4~~ and 5(9) ~~of the Model Regulation~~ are shown below.

    1.   "~~Best estimate~~Anticipated Experience Assumption for the" U.S. Treasury Interest Rate Path. The path will begin with the market yield curve on the ~~Projection Start Date~~Projection Start Date (based on Treasury yields reported by <<insert source>>). The yield curve 120 months or more after the ~~Projection Start Date~~Projection Start Date will be the "ultimate" yield curve shown below. The yield curve on any date between the ~~Projection Start Date~~Projection Start Date and 120 months after the ~~Projection Start Date~~Projection Start Date will be linearly interpolated between the starting yield curve and the "ultimate" yield curve.

        These rates are based on the mean of the distribution of the recalibrated C3 Phase I generator. The yield rates shown below for the ultimate yield curve are annual effective rates (not coupon rates or bond-equivalent yields) for a bond with semi-annual coupons.

1yr or less	x%	11	x%	21	x%
2	x%	12	x%	22	x%
3	x%	13	x%	23	x%
4	x%	14	x%	24	x%
5	x%	15	x%	25	x%
6	x%	16	x%	26	x%
7	x%	17	x%	27	x%
8	x%	18	x%	28	x%
9	x%	19	x%	29	x%
10	x%	20	x%	30yrs or more	x%

For example, if the 5-year Treasury rate on the ~~Projection Start Date~~Projection Start Date is 2.85%, and the 5-year ultimate Treasury rate from the above table is 4.05%, then the 5-year Treasury rate assumed in the deterministic ~~scenario~~Scenario would increase by 0.01% each month for 120 months and then level off at 4.05%. The same linear interpolation would be performed for every point on the yield curve.

Drafting Note: The values in the table above will be determined once the re-calibrated C3 P1 interest rate generator is finalized.

2. Anticipated Experience Assumptions for~~"Best Estimate~~ S&P 500 Returns and Separate Account Fund Performance.

Drafting Note: Further work is needed to define the approach to determine these paths.

3. Anticipated Experience Assumptions for Net Spread Paths on Reinvestments Assets

Drafting Note: Further research is needed to define the approach to determine these paths.

~~G.~~ ~~Modeling of Hedges~~

~~1.~~ ~~General Considerations~~

~~The appropriate costs and benefits of hedging instruments that are currently held by the company in support of the policies falling under the Model Regulation (excluding those that involve the offsetting of the risks associated with products outside of the scope of the Approach) shall be included in the calculation of the Deterministic Reserve and Stochastic Reserve.~~

~~If the company is following a Clearly Defined Hedging Strategy (hedging strategy), as defined in section 7.E.7 of the Model Regulation, in accordance with an investment policy adopted by the Board of Directors or a committee of Board members, the company is eligible to reduce the amount of the Reported Reserve using projections otherwise calculated. The investment policy must clearly articulate the company's hedging objectives, including the metrics that drive rebalancing/trading. This specification could include maximum tolerable values for investment losses, earnings, volatility, exposure, etc. in either absolute or relative terms over one or more investment horizons vis à vis the chance of occurrence. Company management is responsible for developing, documenting, executing and evaluating the investment strategy, including the hedging strategy, used to implement the investment policy.~~

~~For this purpose, the investment assets refer to all the assets including derivatives supporting covered products and guarantees. This is also referred to as the investment portfolio. The investment strategy is the set of all asset holdings at all points in time in all scenarios. The hedging portfolio, which is also referred to as the hedging assets, is a subset of the investment assets. The hedging strategy is the hedging asset holdings at all points in time in all scenarios. The distinction of what is the hedging portfolio and what is the investment portfolio is not in this section. Nor is the distinction between investment strategy and hedging strategy formally made here. Where necessary to give effect to the intent of this section, the requirements applicable to the hedging portfolio or the hedging strategy are to apply to the overall investment portfolio and investment strategy.~~

~~This particularly applies to restrictions on the reasonableness or acceptability of the models that make up the Cash Flow Model used to perform the projections, since these restrictions are inherently restrictions on the joint modeling of the hedging and non-hedging portfolio. To give effect to these requirements, they must apply to the overall investment strategy and investment portfolio.~~

~~The cost and benefits of hedging instruments that are currently held by the company in support of~~

the policies falling under the Model Regulation shall be included in the Cash Flow Model used to calculate the Deterministic Reserve and the Stochastic Reserve. If the company is following a Clearly Defined Hedging Strategy, the model shall take into account the cost and benefits of hedge positions expected to be held by the company in the future based on the operation of the hedging strategy.

Before either a new or revised hedging strategy can be used to reduce the amount of the Reported Reserve otherwise calculated, the hedging strategy should be in place (i.e., effectively implemented by the company) for at least three months. The company may meet the time requirement by having evaluated the effective implementation of the hedging strategy for at least three months without actually having executed the trades indicated by the hedging strategy (e.g., mock testing or by having effectively implemented the strategy with a product exhibiting similar risks for at least three months).

These requirements do not supersede any statutes, laws, or regulations of any state or jurisdiction related to the use of derivative instruments for hedging purposes and should not be used in determining whether a company is permitted to use such instruments in any state or jurisdiction.

2. Background

The analysis of the impact of the hedging strategy on cash flows is typically performed using either one of two methods as described below. Although a hedging strategy would normally be expected to reduce risk provisions, the nature of the hedging strategy and the costs to implement the strategy may result in an increase in the amount of the Reported Reserve otherwise calculated.

The fundamental characteristic of the first method is that all hedging positions, both the currently held positions and those expected to be held in the future, are included in the Cash Flow Model used to determine the Reported Reserve.

The fundamental characteristic of the second method is that the effectiveness of the current hedging strategy (including currently held hedge positions) on future cash flows is evaluated, in part or in whole, outside of the Cash Flow Model. In this case, the reduction to the Reported Reserve otherwise calculated should be commensurate with the degree of effectiveness of the hedging strategy in reducing accumulated deficiencies otherwise calculated.

Regardless of the methodology used by the company, the ultimate effect of the current hedging strategy (including currently held hedge positions), on the Reported Reserve needs to recognize all risks, associated costs, imperfections in the hedges and hedging mismatch tolerances associated with the hedging strategy. The risks include, but are not limited to: basis, gap, price, parameter estimation, and variation in assumptions (mortality, persistency, withdrawal, annuitization, etc.). Costs include, but are not limited to: transaction, Margin (opportunity costs associated with Margin requirements) and administration. In addition, the reduction to the Reported Reserve attributable to the hedging strategy may need to be limited due to the uncertainty associated with the company's ability to implement the hedging strategy in a timely and effective manner. The level of operational uncertainty varies indirectly with the amount of time that the new or revised strategy has been in effect or mock tested.

No hedging strategy is perfect. A given hedging strategy may eliminate or reduce some but not all risks, transforms some risks into others, introduces new risks or has other imperfections. For example, a delta only hedging strategy does not adequately hedge the risks measured by the "Greeks" other than delta. Another example is that financial indices underlying typical hedging instruments typically do not perform exactly like the separate account funds, and hence the use of hedging instruments has the potential for introducing basis risk.

3. Calculation of CTE Amount (reported)

The company should begin by calculating "CTE Amount (best efforts)" – the results obtained when the Stochastic Reserve is based on incorporating the hedging strategy (including currently

58

held hedge positions) into the stochastic Cash Flow Model, including all of the factors and assumptions needed to execute the hedging strategy (e.g., stochastic implied volatility).

Because most models will include at least some approximations or idealistic assumptions, CTE Amount (best efforts) may overstate the impact of the hedging strategy. To compensate for potential overstatement of the impact of the hedging strategy, the company must recalculate the Stochastic Reserve reflecting the impact of risks not completely reduced, eliminated or contemplated by the hedging strategy, all of the costs associated with the hedging strategy, the imperfections in the hedging strategy, and any uncertainty over the effectiveness of the hedging strategy. The result so obtained is called "CTE Amount (adjusted)". In some situations the determination of CTE Amount (adjusted) may include both direct and indirect techniques.

Finally, the reported value for the Stochastic Reserve is given by:

CTE Amount (reported) = CTE Amount (best efforts) +

E × MAX[0,CTE Amount (adjusted) – CTE Amount (best efforts)]

The value for E (an "error factor") reflects the actuary's view as to the level of sophistication of the stochastic Cash Flow Model. As the sophistication of the stochastic cash flow model increases, the value for E decreases, subject to minimum of 0.05 (i.e., the greater the ability of the CTE Amount (best efforts) model to capture all risks and uncertainties, the lower the value of E). If the model used to determine the "CTE Amount (best efforts)" is "state of art", the value "CTE Amount (adjusted) – CTE Amount (best efforts)" may be nominal. On the other hand, if the model used to determine the "CTE Amount (best efforts)" is simplistic, the value "CTE Amount (adjusted) – CTE Amount (best efforts)" may be significant.

4.   Specific Considerations and Requirements

As part of the process of choosing a methodology and assumptions for estimating the future effectiveness of the current hedging strategy (including currently held hedge positions) for purposes of reducing the Reported Reserve, the actuary should review actual historical hedging effectiveness. The actuary must evaluate the appropriateness of the assumptions on future trading, transaction costs, and other elements of the model, the strategy, the mix of business, and other items that could result in materially adverse results. This includes an analysis of model assumptions that, when combined with the reliance on the hedging strategy, may result in adverse results relative to those modeled. The parameters and assumptions must be adjusted (based on testing contingent on the strategy used and other assumptions) to levels that fully reflect the risk based on historical ranges and foreseeable future ranges of the assumptions and parameters. If this is not possible by parameter adjustment, the model must be modified to reflect them at either "best estimates" or adverse estimates of the parameters.

A discontinuous hedging strategy is a hedging strategy where the relationships between the sensitivities to equity markets and interest rates (commonly referred to as the Greeks) associated with some guaranteed policyholder options embedded in some products and these same sensitivities associated with the hedging assets are subject to material discontinuities. Any hedging strategy, including a delta hedging strategy, can be a discontinuous hedging strategy if implementation of the strategy permits material discontinuities between the sensitivities to equity markets and interest rates associated with the guaranteed policyholder options embedded in the variable annuities and other in scope products and these same sensitivities associated with the hedging assets. There may be scenarios that are particularly costly to discontinuous hedging strategies, especially where those result in large discontinuous changes in sensitivities (Greeks) associated with the hedging assets. Where discontinuous hedging strategies contribute materially to a reduction in the Reported Reserve, the actuary must evaluate the interaction of future trigger definitions and the discontinuous hedging strategy, in addition to the items mentioned in the previous paragraph. This includes an analysis of model assumptions that, when combined with the

reliance on the discontinuous hedging strategy, may result in adverse results relative to those modeled.

Implementing a strategy that has a strong dependence on acquiring hedging assets at specific times that depend on specific values of an index or other market indicators may not be implemented as precisely as planned.

The combination of elements of the Cash Flow Model, including the initial actual market asset prices, prices for trading at future dates, transaction costs, and other assumptions should be analyzed by the actuary as to whether the Cash Flow Model permits hedging strategies that make money in some scenarios without losing a reasonable amount in some other scenarios. This includes, but is not limited to:

a.   hedging strategies with no initial investment that never lose money in any scenario and in some scenarios make money; or

b.   hedging strategies that with a given amount of initial money never make less than accumulation at the one period risk free rates in any scenario but make more than this in one or more scenarios.

If the Cash Flow Model allows for such situations, the actuary should be satisfied that the results do not materially rely directly or indirectly on the use of such strategies. In addition, the actuary should disclose the situations and provide supporting documentation at to why the actuary believes the situations are not material for determining the Reported Reserve. If the results do materially rely directly or indirectly on the use of such strategies, the strategies may not be used to reduce the Reported Reserve otherwise calculated.

In addition to the above, the method used to determine prices of financial instruments for trading in scenarios should be compared to actual initial market prices. If there are substantial discrepancies, the actuary should disclose the material discrepancies and provide supporting documentation as to why the model based prices are appropriate for determining the Reported Reserve. In addition to comparisons to initial market prices, there should be testing of the pricing models that are used to determine subsequent prices when scenarios involve trading financial instruments. This testing should consider historical relationships. For example, if a method is used where recent volatility in the scenario is one of the determinants of prices for trading in that scenario, then that model should approximate actual historic prices in similar circumstances in history.

Subsection 11VIII.   Guidance and Requirements for Reflecting Revenue Sharing Assumptions

A.   Requirements

Projections may include income from projected future Revenue Sharing (as defined in these requirements Model Regulation and applicable Guidelines and ASOPs) net of applicable projected expenses (Net Revenue Sharing Income) if the following requirements are met:

1.   The Net Revenue Sharing Income is received and controlled by the company[1];

2.   Signed contractual agreement or agreements are in place as of the Valuation DateValuation Date and support the current payment of the Net Revenue Sharing Income; and

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[1] As in other Subsections of these requirementsis report, the term "the company" is used exclusively as a reference to the insurance company writing the business falling under the scope of these requirements Model Regulation. The term "entity providing the Net Revenue Sharing Income" is self-explanatory and is used consistently in this subsection.

3.   The Net Revenue Sharing Income is not already accounted for directly or indirectly as a company asset.

B.   Revenue Sharing Amounts

The amount of Net Revenue Sharing Income to be used shall reflect the actuary's assessment of factors that include but are not limited to the following (not all of these factors will necessarily be present in all situations):

1.   the terms and limitations of the agreement(s), including anticipated revenue, associated expenses and any contingent payments incurred or made by either the company or the entity providing the net Revenue Sharing as part of the agreement(s);

2.   The relationship between the company and the entity providing the Net Revenue Sharing Income that might affect the likelihood of payment and the level of expenses;

3.   The benefits and risks to both the company and the entity paying the Net Revenue Sharing Income of continuing the arrangement;

4.   The likelihood that the company will collect the Net Revenue Sharing Income during the term(s) of the agreement(s) and the likelihood of continuing to receive future revenue after the agreement(s) has ended;

5.   The ability of the company to replace the services provided to it by the entity providing the Net Revenue Sharing Income or to provide the services itself, along with the likelihood that the replaced or provided services will cost more to provide; and

6.   The ability of the entity providing the Net Revenue Sharing Income to replace the services provided to it by the company or to provide the services itself, along with the likelihood that the replaced or provided services will cost more to provide.

All expenses required or assumed to be incurred by the company in conjunction with the arrangement providing the Net Revenue Sharing Income, as well as any expenses assumed to be incurred by the company in conjunction with the assumed replacement of the services provided to it (as discussed in subsection B.5 above) shall be included in the projections as a company expense. In addition, expenses incurred by either the entity providing the Net Revenue Sharing Income or an affiliate of the company shall be included in the applicable expenses that reduce the Net Revenue Sharing Income.

C.   Margins

The amount of projected Net Revenue Sharing Income shall also reflect a Margin (which decreases the assumed Net Revenue Sharing Income) directly related to the uncertainty of the revenue, including uncertainty regarding the creditworthiness of the provider of the Net Revenue Sharing Income. The greater the uncertainty, the larger the Margin. [2]

To the extent the agreements(s) guarantees[3] the payment of Net Revenue Sharing Income to the company, the net revenue may be included in full over the period for which it is guaranteed.[4]

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[2] Because the uncertainty would be expected to increase over time, it may be necessary to decrease the revenue by larger amounts in later ~~projection period~~Projection Periods.

[3] Provisions such as one that gives the entity paying the Net Revenue Sharing Income the option to stop or change the level of income paid would prevent the income from being guaranteed. However, if such an option becomes available only at a future point in time, and the revenue up to that time is guaranteed, the income is considered guaranteed up to the time the option first becomes available.

[4] If the agreement allows the company to unilaterally take control of the underlying fund fees that ultimately result in the Net Revenue Sharing Income then the revenue is considered guaranteed up until the time at which the company can take such control. Since it is unknown whether the company can perform

D.   Additional Requirements:

The actuary is responsible for reviewing the revenue sharing agreements, verifying compliance with these requirements, and documenting the rationale for any source of Net Revenue Sharing Income used in the projections.

Subsection 12~~IX~~.   ~~Guidance and~~ **Requirements for Setting Reinsurance Assumptions**

A.   Knowledgeable Counterparty

The actuary shall assume that the counterparty to a reinsurance agreement is knowledgeable about the contingencies involved in the agreement and thus likely to exercise the terms of the agreement to its advantage, taking into account the context of the agreement in the entire economic relationship between the parties. Items that should be considered by the actuary for non-guaranteed elements in reinsurance cash flows shall include any limits placed upon the other party's ability to exercise contractual changes in the treaty terms, the usual and customary practices associated with such agreements, past practices by the parties concerning the changing of terms, the ability of the direct-writing company to modify the terms of its policies in response to changes in terms from its reinsurers, and actions that might be taken by a party if the counterparty has financial problems.

1.   Consideration of ceding company actions. The assumptions that are used by the ceding companies to determine the ~~Reported Reserve~~Reported Reserve shall take into account any actions that have been or are, in the actuary's judgment, likely to be taken by the ceding company and, if different, the direct-writing company that could affect the expected cash flows of the reinsured business. Examples of actions that could be taken by the direct-writing company include internal replacement programs or special underwriting programs, both of which could have the effect of increasing expected mortality, and changes in non-guaranteed elements in the reinsured policies, which could affect mortality, policyholder behavior, and possibly expense and investment assumptions. Examples of actions that could be taken by the ceding company include the exercise of contractual options in a reinsurance agreement to influence the setting of non-guaranteed elements in the reinsured policies, and to participate in claim decisions.

2.   Consideration of assuming company actions. The assumptions that are used by assuming companies to determine the ~~Reported Reserve~~Reported Reserve shall take into account any actions that have been or are, in the actuary's judgment, likely to be taken by the assuming company that could affect the expected cash flows of the reinsured business. Examples of actions that could be taken by the assuming company that could affect the expected cash flows include changes to the current scale of reinsurance premiums or expense allowances, where contractually allowed. The ability of an assuming company to change such rates or allowances in a reinsurance agreement may be thought of as comparable to the ability of a direct-writing company to change non-guaranteed elements on policies. Thus, appropriate assumptions for this option may be dependent on the scenario being tested (analogous to changes in Cost of Insurance Charges). All likely consequences of such actions by the assuming company should be taken into account, including, for example, any potential impact on the probability of recapture by the ceding company.

3.   Treatment of ceding company recapture options. A ceding company option to recapture reinsured business shall be taken into account by both the ceding and assuming companies to determine ~~Reported Reserve~~Reported Reserves. The right of a ceding company to recapture is comparable for reinsurers to policyholder surrender options for a direct-writing company. Thus, appropriate assumptions for this option may be dependent on the scenario being tested (analogous to interest-sensitive lapses). When a recapture is assumed, all associated cash flows should be taken into account, including the payment or receipt of any recapture fees or other termination settlements.

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the services associated with the revenue sharing arrangement at the same expense level, it is presumed that expenses will be higher in this situation. Therefore, the Net Revenue Sharing Income shall be reduced to account for any actual or assumed additional expenses.

4.   Treatment of assuming company termination options. An assuming company right to terminate in-force reinsurance business shall be taken into account by both the ceding and assuming companies to determine ~~Reported Reserve~~Reported Reserves. In many cases, the assuming company's right to terminate is limited to cases of non-payment of amounts due by the ceding company or other specific, limited circumstances. In such cases, the actuary would normally expect this termination option to have insignificant value to either party. However, if a reinsurance agreement contains other termination provisions, the actuary should set appropriate assumptions for this option, perhaps dependent on the particular scenario being tested.

B.   Modeling when assets are not in the possession of the company

1.   Assets held by another party. If under the terms of the reinsurance agreement, some of the assets supporting the reserve are held by the reinsurer or by another party, the actuary must determine whether such assets in that portfolio must be modeled in order to determine either discount rates or projected cash flows. In some situations, modeling of the assets held by the other party may not be necessary. An example would be modeling by a reinsurer of a reinsurance agreement containing provisions, such as experience refund provisions, under which the cash flows and effective investment return to the reinsurer are the same under all ~~scenario~~Scenarios. If a conclusion is reached that modeling is unnecessary, the actuary should document the testing and logic leading to that conclusion.

Drafting Note: Additional work may be needed to address considerations when it is necessary to model the business.

2.   Special considerations for modified coinsurance. Although the Modified Coinsurance (Modco) Reserve is called a reserve, it is substantively different from other reserves. It is a fixed liability from the ceding company to the reinsurer in an exact amount, rather than an estimate of a future obligation. It might better be referred to as a Deposit. This concept is clearer in the economically identical situation of Funds Withheld. Therefore, the value of the Modified Coinsurance Reserve will generally not have to be determined by modeling. However, the projected Modified Coinsurance Interest may have to be modeled. In many cases, the Modified Coinsurance Interest is determined by the investment earnings of an underlying asset portfolio, which in some cases will be a segregated asset portfolio or in others the ceding company's general account. Some agreements may use a rate not tied to a specific portfolio.

C.   Credit Risk

1.   Ceded Reinsurance. In forming a judgment and setting Margins to reflect potential uncertainty regarding the receipt of cash flows from the reinsurer, the actuary should take account the ratings, risk-based capital ratio or other available information bearing on the probability of default by the reinsurer, together with the likely impact on cash flows expected to be received from or paid to the reinsurer. In determining the likely impact on cash flows, the actuary should take into account any security posted by the reinsurer or other factor limiting such impact; to the extent such security or other factor is expected to be available to mitigate such impact. In many cases, the provision for reinsurer credit risk in capital requirements will be sufficient, and no Margins will be necessary for this purpose in reserve calculations. However, if a reinsurer is known to have a financial impairment, ~~margin~~Margin for default by the reinsurer may be necessary.

2.   Assumed Reinsurance. In most reinsurance agreements, the reinsurer may terminate the reinsurance upon non-payment by the ceding company. Therefore, a Margin for potential receipt of cash flows from the ceding company will not usually be necessary. If termination of the reinsurance would result in a greater ~~Reported Reserve~~Reported Reserve, the actuary should take into account the items in the preceding paragraph in forming a judgment and setting Margins to reflect potential uncertainty of cash flows from the ceding company.

DOCUMENTATION AND DISCLOSURE REQUIREMENTS WHEN DETERMINING RESERVES BASED ON THE PRINCIPLES-BASED LIFE RESERVES MODEL REGULATION

Table of Contents

I.   Purpose and Scope

This Guideline provides documentation and disclosure requirements for establishing reserves for policies subject to the Principles-Based Reserves for Life Products Model Regulation (referred to throughout this Guideline as the "Model Regulation."). Documentation and disclosure regarding reserve valuation assumptions for other supplemental benefits and riders not directly identified in the scope are to be consistent with the requirements defined by this Guideline.

II.   Definitions

Definitions used in this Guideline are specified in the Model Regulation.

III.   General Documentation and Disclosure Requirements.

      A.   Actuarial Certification

            The Model Regulation requires a Qualified Actuary to prepare a certification that the Reported Reserve was calculated in a manner that meets the requirements of the Model Regulation and complies with all applicable Actuarial Standards of Practice. This certification should identify the items on which the Qualified Actuary is providing information, and a statement as to the accuracy, completeness or reasonableness, as applicable, of the items. This certification shall include the signature, title, company, address and telephone number of the person rendering the certification, as well as the date on which it is signed.

      B.   Actuarial Report

            The Model Regulation requires the actuary to prepare an Actuarial Report that documents the key modeling decisions made by the Actuary, including a description of the valuation assumptions and methods, as well as portraying the results including any results of applicable sensitivity tests. The Report shall include:

            1.   All items required by Section 6.B.1. of the Model Regulation.

            2.   All items required by this Guideline.

            3.   A list of key risk and experience reporting elements that the company will be tracking, the frequency of that tracking and a documentation of past management actions taken because of that tracking.

            4.   Additional analytics as required by the NAIC or Actuarial Standards of Practice.

C. Reliability of Discount Rates. As a test of the consistency between the Discount Rates and the investment process being modeled, the actuary shall perform the following calculation:

1. For a selected Scenario and Asset Segment, set the starting asset amount exactly equal to the Scenario Reserve for that Asset Segment (which is likely to be different than the starting asset amount used to determine the Scenario Reserve).

2. Project the accumulated assets to the end of the Projection Year that gave rise to the Greatest Present Value of Accumulated Deficiencies using the same model and assumptions used to calculate the Scenario Reserve.

3. Discount the value in C.2. to the valuation date using the path of Discount Rates used to calculate the Scenario Reserve.

4. Provide an explanation if the amount in C.3. is materially different than zero.

Drafting Note: The NAIC will determine the frequency of the test and the Scenario to be used.

D. Treatment of Non-Guaranteed Elements, Reinsurance Agreements and Revenue Sharing.

Drafting Note: It is anticipated that disclosure and documentation requirements will be incorporated in this Guideline for these items.

Subsection 13IV. **Documentation and Disclosure Requirements for Setting Mortality Assumptions**

A. General Documentation Requirements

The Report shall include any material considerations that the actuary considers necessary to understand the development of mortality assumptions for the statutory valuation even if such considerations are not explicitly mentioned in this section. The documentation should be explicit when material judgments were required and such judgments had to be made without supporting historical experience.

AB. Specific Documentation Requirements for Mortality Assumptions

The Actuarial Report shall disclose/document the following items with respect to mortality assumptions:

1. Experience Mortality:

   a. Summarize any mortality studies used to support mortality assumptions, quantify the exposures and corresponding deaths, describe the important characteristics of the exposures and comment on unusual data points or trends;

   b. Document the age of the experience data used to determine expected mortality curves and comment on the relevance of the data;

   c. Describe how the expected mortality curves compare to recent historical experience and comment on any differences;

   d. The actuary shall provide an actual to expected analysis at least once every three years.

   e. If the study was not done on a block of business that was similar to the block of business being valued, a similar business segment, identify the differences between the in the block of business on buwhich siness segment on which the data was gathered and the block of business being valued. business segment on which the data was used to determine mortality assumptions for the statutory valuation. Describe how these differences were reflected in the mortality used in modeling;

   f. Explain how the curve reflects the wearing off of underwriting over time;

65

g.   Discuss any assumptions made on mortality improvements, the support for such assumptions and how such assumptions adjusted the modeled mortality;

h.   Any other relevant important information concerning any adjustments to the experience mortality for changes in the mortality assumption;

     i.   Explain the rationale for any adjustment,

     ii.   Document, describe and summarize any studies used to support the adjustment,

     iii.   Document the mathematics used to adjust the mortality,

     iv.   Any other relevant important information concerning any adjustments to the experience mortality for changes in the mortality assumption;

i.   Identification and quantification of any changes in mortality assumptions from the prior year;

j.   Any other relevant important information concerning the mortality assumption.

2.   ~~Results of~~ Credibility Analysis:

     ~~The Report shall include~~<u>a. Identify the credibility methodology used,</u>

     <u>b.   Discuss the appropriateness of the credibility procedure used</u>

     <u>c.   Describe how partial credibility was applied to subcategories</u>

     <u>d.   Discuss</u> the result of the credibility analysis used to adjust experience mortality curves.

3.   <u>Assumption</u> ~~Valuation~~ Margins:

     <u>a.   Describe the approach to define the Margins used.</u>

     <u>b.   Provide a summary of the assumption Margins used.</u>

     <u>c.   Provide results of sensitivity tests.</u> ~~The Report shall include documentation of the determination and application of valuation Margins applied to determine a Prudent Best Estimate Assumption.~~

4.   Additional Adjustments to Mortality Curves

     ~~The Report shall:~~

a.   Explain the rationale for any adjustment.

b.   Document, describe and summarize any studies used to support the adjustment.

c.   Document the mathematics used to adjust the mortality.

d.   Provide any other relevant important information concerning any adjustments to the experience mortality for changes in the mortality assumption.

5.   Valuation Mortality Table:

     <u>a.   </u>~~The Report~~<u>Provide</u> ~~shall document~~ the rationale and results of the analysis used in the selection of the mortality table(s).

b. ~~The Report~~ Provide ~~shall include~~ a comparison of the mortality rates of the ~~Prudent Best Estimate~~Prudent Estimate mortality assumption with the selected Commissioner's Standard Mortality Table.

V. ~~Documentation and Disclosure Requirements for Setting Policyholder Behavior Assumptions~~

A. ~~General Documentation Requirements~~

~~The Report shall include any material considerations that the actuary considers necessary to understand the development of policyholder behavior assumptions even if such considerations are not explicitly mentioned in this section. The documentation should be explicit when material judgments were required and such judgments had to be made without supporting historical experience.~~

B. ~~Specific~~ Documentation Requirements for Policyholder Behavior Assumptions

The ~~Report~~Actuarial Report shall disclose/document the following items with respect to policyholder behavior assumptions:

1. The premium persistency, lapse, withdrawal and other policyholder behavior assumptions used and any changes in these assumptions since the last valuation;

2. A description of the process used to establish the ~~Prudent Best Estimate~~Prudent Estimate ~~(PBE)~~ assumptions for policyholder behavior, and any change in process since the last valuation;

3. If the actuary determines that a previously defined set of policyholder behavior assumptions is still appropriate, a description of the experience and analysis that led to that conclusion;

4. A description of the framework for assigning assumptions to policies in the ~~Deterministic Reserve~~Deterministic Reserve calculation and in the ~~Stochastic Reserve~~Stochastic Reserve calculation, and any changes in the framework since the last valuation. This description should indicate how the actuary concluded that further refinement in granularity of the framework would not materially impact the reserves;

5. A description of the sources of data used to develop Prudent Estimate ~~PBE~~ assumptions including recent historical company experience and relevant industry data, if any. This description should include commentary on the reasonableness and appropriateness of the data that were used;

6. A description and rationale of the assumptions used, and the results of sensitivity tests that underlie the Prudent Estimate~~PBE~~ premium payment assumptions. Sensitivity tests must include, but are not limited to, the following premium payment assumptions:

   a. Minimum premium scenario;
   b. No further premium payment scenario;
   c. Pre-payment of premiums – Single premium scenario;
   d. Pre-payment of premiums – level premium scenario.

7. A description of the Margins for adverse deviation included in withdrawal assumptions and the basis of determining these Margins.

8. A description of the scenario-dependent mechanism, if any, for varying withdrawal assumptions.

9. A description of the scenario-dependent mechanism, if any, for varying premium assumptions.

10. A description of changes in premium payment assumptions and withdrawal assumptions related to the treatment of non-guaranteed elements in the reserve calculations.

11. An explanation of how assumptions were set beyond the point where fully credible relevant experience was available.

12.   The actuary shall provide an actual to expected analysis at least once every three years.

VI.   ~~**Documentation and Disclosure Requirements for Setting Expense Assumptions**~~

C~~A~~.   Documentation Requirements for Expense Assumptions

The ~~Report~~Actuarial Report shall disclose/document the rationale and support for the expense assumptions and shall include the following items:

~~1.~~   ~~A reconciliation of actual expenses to those used for valuation purposes. A validation tool is provided in subsection B below;~~

1~~2~~.   The methodology used to allocate expenses to the policies subject to the~~se requirements~~ ~~Model Regulation~~.

2~~3~~.   The methodology used to apply the allocated expenses within the ~~Cash Flow Model~~Cash Flow Model.

~~B.~~   ~~Validation of Expense Assumptions to Actual Data.~~

~~The actuary shall prepare a demonstration that the appropriate level of fully allocated expenses (from the annual statement) is reflected in the valuation expense assumptions.~~

~~The following Exhibit must be completed annually.~~

~~A)Expenses~~	~~Prior Year Actual~~	~~Current Year Actual~~	~~Current Year Modeled *~~
~~(1) Exhibit 2 – General Expenses~~			
~~(2) Exhibit 3 – T, L & F's~~			
~~(3) Expenses from Plans and Policies Not Covered in Model included in (1) & (2)~~			
~~(4) Nonrecurring Expenses That Have Occurred Prior to Valuation included in (1) & (2)~~			
~~(5) Acquisition Expenses That Have Occurred Prior to Valuation included in (1) & (2)~~			
~~(6) Acquisition Expenses and Significant Non-recurring Expenses that are Expected to Occur after the valuation~~			
~~(7) Equals (1) + (2) – (3) – (4) – (5) + (6)~~			
~~B)Commissions~~			
~~(8) Commissions (Direct and Assumed Business)~~			
~~(9) Reinsurance Expenses in Ex. 1, Part 2 that are not included elsewhere~~			
~~(10) Commissions from Plans and Policies Not Modeled included in (8) & (9)~~			

(11) Commissions from Model Plans that are Paid Prior to Valuation included in (8) & (9)			▓▓▓
(12) Equals (8) +(9) - (10) - (11)			

* Current year modeled expenses are calculated by applying the model unit expenses to the actual average in force of the plans that are modeled.

Instructions:

1. Exhibit 2, Line 15, Column 1.

2. Exhibit 3, Line 10, Column 1.

3. Expenses in Item (1) and Item (2) that are from plans and policies not covered in the model for principles-based reserves. Expenses that cannot be allocated to specific plans should be prorated based on methods described in this document and fully disclosed.

4. Expenses in Item (1) and Item (2) but not included in Item (3) that are nonrecurring expenses and have occurred prior to the end of the year valuation date.

5. Expenses in Item (1) and Item (2) but not included in Item (4) that are acquisition expenses and have occurred prior to the end of the year valuation date. Expenses that cannot be allocated easily to acquisition expenses should be prorated based on methods described in this document and fully disclosed.

6. Expenses of the type mentioned in Item (4) and Item (5) that are acquisition expenses and significant non-recurring expenses and are expected to occur in the next calendar year. Allocations should be based on methods described in this document and fully disclosed.

7. Exhibit 1, Part 2, Line 31, Column 3 and Line 26.2, Column 3.

8. Reinsurance Expenses in Exhibit 1, Part 2 that are not included elsewhere in the model for principles-based reserves. These reinsurance expenses should only include expenses from plans covered in the model for principles-based reserve.

9. Commissions and expenses listed in Item (8) and Item (9) that are from plans and policies not covered in the model for principles-based reserves. Commissions and expenses including bonuses that cannot be allocated to specific plans should be prorated based on methods described in this document and fully disclosed.

10. Commissions and expenses listed in item (8) that are from plans in the model but paid prior to the end of the year valuation date. Commissions and expenses including bonuses that cannot be allocated to specific plans should be prorated based on methods described in this document and fully disclosed.

DVII. Documentation and Disclosure Requirements for Setting Asset Assumptions

A. Documentation Requirements for Asset Assumptions

1. The ReportActuarial Report shall disclose/document the rationale and support for the asset assumptions and shall include at least the following items:

   a1. The asset investment strategy used to project future asset purchases in the model, and certification from an investment officer that it is consistent with the company's current investment strategy;

   b2. Reinvestment and disinvestment assumptions;

c3. Asset default cost assumptions, with particular attention to the following required items:

    (1)a. Description of the development of ~~best estimate assumption~~Anticipated Experience Assumptions, and the rationale for the manner in which company historical experience was reflected;

    (2)b. Rationale for the choice of experience period for all supporting company, industry, and broad market data sources used. Include the rationale for any change in method of determining such periods;

    (3)c. Rationale for the ~~margin~~Margins chosen for the various asset classes, including any situations where lower quality assets do not have higher Margins (when expressed as a percentage of the credit exposure on the corresponding assets) than higher quality assets of similar maturities.

d4. Investment expense assumptions;

e5. Bond call function;

f6. Mortgage prepayment function;

g7. Determining market value for assets sold due to disinvestment strategy;

h8. Grouping of general account equity investments for modeling;

i9. Grouping of separate account funds and subaccounts for modeling;

j10. Interest rate and equity return ~~scenario~~Scenarios used, including real estate and other non fixed income assets.

k11. Exposure to foreign currency fluctuations.

~~B.~~ 2. Additional disclosure items to be included in the ~~Report~~Actuarial Report:

a1. Scenarios. A description of the methods used to generate stochastic interest rates, equity performance, and separate account fund performance, and the results of calibration if required;

b2. ~~Asset Segment~~Asset Segments. Description of the ~~asset segment~~Asset Segments;

c3. Starting Assets. For each ~~asset segment~~Asset Segment, the amount and types of assets used in the ~~Cash Flow Model~~Cash Flow Model, and the method and rationale for selecting the assets used. In situations where ~~asset segment~~Asset Segments include policies that are not subject to the~~se requirements~~ ~~Model Regulation~~, the method of apportioning the total amount of assets between the subject and non-subject policies shall be described;

d4. Embedded Spread on Starting Assets. All required disclosure items listed in Subsection 5(C)(5)~~of Section 7 of the Model Regulation~~.

e5. Net Asset Earned Rates. For each ~~Asset Segment~~Asset Segment, a summary of the path of Net Asset Earned Rates calculated for the ~~Deterministic Reserve~~Deterministic Reserve.

36. Derivative Program Documentation and ~~Hedging~~ Certification ~~and Documentation~~

a. The actuary shall provide documentation for the company's Derivative Programs that affect Asset Segments subject to these requirements, starting with a list that identifies and summarizes the purpose of each Derivative Program, that clarifies whether it involves the

future purchase or sale of Derivative Instruments, and if so whether it is a Clearly Defined Hedging Strategy, and whether it is a static or dynamic strategy.

b. For each dynamic Clearly Defined Hedging Strategy, the actuary shall document the extent to which the Derivative Program and its associated Risk Factors are fully incorporated into the Cash Flow Model and the extent to which the Cash Flow Model is supplemented by the Provision for Model Understatement calculations.

c. In addition, the actuary shall provide a certification and maintain documentation supporting such certification that each Derivative Program modeled as a Clearly Defined Hedging Strategy meets the requirements of a Clearly Defined Hedging Strategy. The certification shall include a statement to the effect that the implementation of the Derivative Program in the stochastic Cash Flow Model and any Provision for Model Understatement analysis does not include knowledge of events that occur after any action dictated by the Derivative Program (i.e. the model cannot use information about the future that would not be known in actual practice).

d. A financial officer of the company (e.g., Chief Financial Officer, Treasurer or Chief Investment Officer) or a person designated by such financial officer who has direct or indirect supervisory authority over the actual trading of Derivative Instruments shall certify that each Derivative Program that involves anticipated future Derivative Instrument transactions is being used by the company in a manner consistent with the actuary's documentation of the program, and that each Derivative Program that is modeled as a Clearly Defined Hedging Strategy meets the requirements of a Clearly Defined Hedging Strategy.

~~The actuary must provide a certification that the values for E, CTE Amount (adjusted) and CTE Amount best efforts) were calculated using the process defined in the Model Regulation and other applicable regulations and guidelines, and the assumptions used in the calculations were reasonable for the purpose of determining the Reported Reserve. The actuary must document the method(s) and assumptions (including data) used to determine CTE Amount (adjusted) and CTE Amount (best efforts) and maintain adequate documentation as to the methods, procedures and assumptions used to determine the value of E.~~

~~The actuary must provide a certification as to whether the Clearly Defined Hedging Strategy is fully incorporated into the cash flow model and any supplementary analysis of the impact of the hedging strategy on the Reported Reserve. The actuary must document the extent to which elements of the hedging strategy (e.g., time between portfolio rebalancing) are not fully incorporated into the cash flow model and any supplementary analysis to determine the impact, if any. In addition, the actuary must provide a certification and maintain documentation to support the certification that the hedging strategy designated as the Clearly Defined Hedging Strategy meets the requirements of a Clearly Defined Hedging Strategy including that the implementation of the hedging strategy in the stochastic cash flow model and any supplementary analysis does not include knowledge of events that occur after any action dictated by the hedging strategy (i.e. the model cannot use information about the future that would not be known in actual practice.).~~

~~A financial officer of the company (e.g., Chief Financial Officer, Treasurer or Chief Investment Officer) or a person designated by them who has direct or indirect supervisory authority over the actual trading of assets and derivatives must certify that the hedging strategy meets the definition of a Clearly Defined Hedging Strategy and that the Clearly Defined Hedging Strategy is the hedging strategy being used by the company in its actual day to day risk mitigation efforts.~~

E. Documentation Requirements for the Provision for Model Understatement

The actuary shall provide documentation for the calculation of the Provision for Model Understatement, including at least the following:

1. A list of the material approximations, simplifying assumptions or simplified techniques used in the Cash Flow Model that the actuary considered necessary to evaluate as part of the Provision for Model Understatement.

2. Each element of the model to which the items in Subparagraph (1) above apply, e.g. Risk Factors, policy benefits, asset classes, investment strategies, risk mitigation strategies, etc.

3. If there is more than one model element included in the Provision for Model Understatement calculation, the documentation shall clarify whether the Provision for Model Understatement was determined separately for each element or collectively for groups of two or more elements, and the documentation shall explain the methodology, supporting rationale and key assumptions for how separate Provision for Model Understatement calculations were combined to determine an aggregate Provision for Model Understatement.

4. A description of each model that was used to determine the Provision for Model Understatement for a model element or group of model elements, the actuary's rationale for selecting the model and the key assumptions underlying the model.

F. Documentation Requirements for Non-Guaranteed Elements, Reinsurance Agreements and Revenue Sharing Assumptions.

Drafting Note: It is anticipated that disclosure and documentation requirements will be incorporated in these requirements for these items.