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Principles-Based Approach Update

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Section 1

Framework

Governing Documents

- Standard Valuation Law ("SVL")
  – Current draft: **http://www.naic.org/documents/committees_lhatf_svl.doc**
  – Draft as of May 31, 2008
  – Comments to: **jengelha@naic.org** by July 15, 2008 (yesterday)
- Valuation Manual ("VM")
  – Current draft: **http://www.naic.org/committees_lhatf.htm**
  – Draft as of May 31, 2008
  – Comments to: **jengelha@naic.org** by July 15, 2008 (yesterday)
- Actuarial Standards of Practice
  – Current draft – Independent Review of Principles-Based Valuations: **http://www.actuary.org/pdf/life/asb_review_may07.pdf**
  – Current draft – Standards for Principles-Based Reserves for Life Products: **http://www.actuary.org/pdf/life/asb_reserves.pdf**

A Few Definitions in Proposed SVL

- "Appointed actuary" – qualified actuary retained to prepare the actuarial opinion either directly by the board of directors or by the authority of the board of directors
- "Cash flows" – any receipt, disbursement, or transfer of cash or asset equivalents
- "Policyholder behavior" – any action a policyholder may take under a policy including, but not limited to:
  - Lapse
  - Withdrawal
  - Transfer
  - Deposit
  - Premium payment
  - Loan
  - Annuitization
  - Benefit elections
- "Principle-based valuation" – a reserve valuation specified in the VM that uses one or more methods or one or more assumptions determined by the insurer
- "Valuation manual" ("VM") – the manual of valuation instructions adopted by the NAIC

Items to be Addressed in VM per Proposed SVL

- Specifics of the opinion of the appointed actuary
- Specifics of the memorandum of the appointed actuary
- Company exemptions
- Standards for valuation
- Minimum for principle-based valuation, greater of:
  - $0
  - Cash surrender value
  - Present value of cash flows
- Other requirements, including but not limited to:
  - Reserve methods
  - Models for measuring risk
  - Generation of economic scenarios
  - Assumptions
  - Margins
  - Use of company experience
  - Risk measurement disclosure

Conditions for Principle-Based Valuation per the Proposed SVL

- Capture all benefits & guarantees & their identifiable, quantifiable & material risks
- Incorporate assumptions, risk analysis methods & models & management techniques that are consistent with those utilized with the company's overall risk assessment process
- Incorporate assumptions & methods that:
  - Utilize the company's anticipated experience to establish assumptions for risks specific to the company based on:
    - The availability of relevant company data
    - The degree of credibility of company data
    - A credibility weighted blending of company experience & prescribed assumptions or assumptions derived from prescribed methods for setting assumptions
  - Utilize prescribed assumptions or methods for assumptions for risks that are not specific to the company or over which the company has no control
  - Reflect a level of conservatism consistent with the objective of statutory financial reporting
  - Provide margins for uncertainty including adverse deviation & estimation error
- Use assumptions to the conservative end of the range of plausible scenarios
- Adopt internal controls
- Prepare report

Other Issues in SVL

- Caution – The commissioner may require a company to change any assumption or method that the commissioner determines is necessary in order to comply with the requirements of the VM or the SVL, & the company shall adjust the reserves as required by the commissioner.
- Experience reporting – Required to file the following experience, as prescribed in the VM:
  - Mortality
  - Morbidity
  - Policyholder behavior
  - Expenses
- Single state exemption – Commissioner may exempt specific product forms or product lines of a company that is licensed & doing business in only 1 state

Dates in the Proposed SVL

- Split valuation
  - Policies prior to operative date of VM – current approaches
  - Policies on or after operative date of VM – principle-based valuation
- Operative date of VM – January 1 of the calendar year following July 1 of the calendar year when all of the following have occurred:
  - VM adopted by NAIC by the greater of 42 members or ¾ of members voting
  - The amended SVL has been adopted by states representing at least ½ of the direct premiums written
  - The amended SVL has been adopted by at least 42 jurisdictions
- Future changes to the VM are effective when adopted by the NAIC by the members:
  - Representing ¾ of members voting, but not less than ½ of total membership
  - Representing ½ of direct premiums written
- Effective date of SVL – January 1, 1944

VM Outline

- VM-00 – Introduction
- VM-01 – Definitions for terms in requirements
- VM-20 – Requirements for principles-based reserves for life products
- VM-25 – Health insurance reserves minimum reserve requirements
- VM-26 – Credit life & disability reserve requirements
- VM-30 – Actuarial opinion & memorandum requirements
- VM-31 – Reporting & documentation requirements for business subject to a principle-based reserve valuation
- VM-50 – Experience reporting requirements
- VM-51 – Experience reporting formats
- VM-A – VM appendix A
- VM-C – VM appendix C

Future Timeline

- 2008 Fall National Meeting
  - LHATF to adopt SVL
- 2008 Winter National Meeting
  - Plenary to adopt SVL
  - LHATF to adopt VM
- 2009 Summer National Meeting
  - Finalize VM process
  - Changes to AOMR
  - Transition plan
  - Adopt new mortality tables & underwriting algorithm
  - Finalize reserve review process
  - Develop interest rate generator
- 2009 - ?
  - States adopt SVL
- Effective date?

Section 2

AAA Consistency Work Group

AAA Consistency Work Group

- September 2007 Report: **http://www.actuary.org/pdf/life/consistency_sept07.pdf**
- Conceptual Framework – Similar to concept outlined in SVL

Purpose of Reserves

- Existing Guidance
  - Statutory Accounting Principles, Statement of Concepts
  - NAIC Risk-Based Capital Instructions
  - Current Statutory Framework
- Reserves – Under Principles-Based Approach, purpose of reserves is to make provision for future anticipated costs of benefits & guarantees
  - Should recognize asset cash flows, expenses, future premiums, & other revenues
  - Cash flows may be aggregated
  - Economic value of items related to the contracts, such as commissions or revenue sharing, should be included
  - Reserves should be set within the range of expected outcomes & include measures of anticipated experience plus a margin for uncertainty. Should reflect adjustments for simplifications in the model. Shall be reasonably conservative.
- Risk-Based Capital ("RBC") – Purpose is to identify weakly capitalized companies
  - Should ensure that the required level of reserves remains covered
  - Should recognize at least the risks included in reserves
  - Should recognize at least the revenues included in reserves
  - Each component of RBC should be calibrated to facilitate identification of weakly capitalized companies
- Relationship of Reserves & RBC

Risks to be Reflected in Reserves

- General – Arising from actual or potential events which are both:
  - Directly related to those policies or their supporting assets
  - Determined capable of materially affecting the reserve
- Asset risks – Categories & examples
  - Separate account performance
  - Credit risks
  - Commercial mortgage loan rollover rates
  - Uncertainty in the timing or duration of asset cash flows
  - Performance of equities, real estate, & Schedule BA assets
  - Risk associated with hedge instruments
  - Currency risk

Risks to be Reflected in Reserves (cont.)

- Liability risks – Categories & examples
  - Reinsurer default, impairment, or rating downgrade know to have occurred before or on the valuation date
  - Mortality/longevity risk
  - Persistency/lapse risk
  - Early payment of benefits risks
  - Premium payment risk
  - Anticipated mortality trends
  - Annuitization risks
  - Additional premium dump-ins
  - Performance of indices in relation to contractual guarantees
- Combination risks – Categories & examples
  - Risks modeled in the company's risk assessment processes
  - Disintermediation risk

Risks Not to be Reflected in Determination of Reserves

- Asset risks – Liquidity risks associated with a “run on the bank”
- Liability risks
  - Reinsurer default, impairment, or rating downgrade occurring after the valuation date
  - Catastrophic events
  - Major breakthroughs in life extension technology that have not yet altered recently observed mortality experiences
  - Significant future reserve increases as an unfavorable scenario is realized
- General business risks
  - Deterioration of reputation
  - Future changes in anticipated experience which would be triggered if & when adverse modeled outcomes were to actually occur
  - Poor management performance
  - Expense risks associated with fluctuating amounts of new business
  - Risks associated with future economic viability of the company
  - Moral hazards
  - Fraud & theft

Section 3

Calculating PBR

Step #1 – Determine Prudent Estimate Assumptions ("PEA")

- Determine for every risk factor that is not prescribed or stochastically modeled. Developed by applying margin to the anticipated experience assumption.
- Use own experience, if relevant and credible, to establish anticipated experience assumption.
- As appropriate, assumptions shall vary from scenario to scenario
- PEA shall be:
  - Based on available, relevant and credible experience, including, but not limited to, the company's own experience and industry experience
  - Set to produce an overall value for the reserve that is consistent with the objectives of statutory reporting
  - Reviewed periodically and updated as appropriate

Mortality Assumption

- Much of process is still undefined – The following is clearly oversimplified
- Credibility segment – Have similar underwriting and mortality experience characteristics
- For each credibility segment, determine if it qualifies for the simplified method (TBD)
  - No. Use underwriting scoring procedure to determine applicable valuation table (2008 CSO?)
  - Yes. Use blend of actual experience and valuation table determined from the underwriting scoring procedure

Policyholder Behaviors

- Premium payment patterns
- Premium persistency
- Surrenders
- Withdrawals
- Allocations between available investment and crediting options
- Benefit utilizations
- Other option elections
- Any other identified behavior

Policyholder Behavior Assumptions

- General
  - Shall reflect expectations regarding variations relative to characteristics that have a significant impact on reserves
  - Shall be appropriate for the block of business valued
  - Shall be based on actual experience, if possible
  - Shall reflect the outcomes and events exhibited by historical experience only to the extent it is relevant
  - Shall reflect the likelihood that policyholder behavior will be affected by any significant increase in value of a product option
  - Shall be assigned to policies in a manner that provides appropriate level of granularity
- Dynamic assumptions where appropriate
- Margins for behavior – Provides for credibility, sensitivity, uncertainty, assumption that policyholder behavior is more efficient over time, and is higher where marketing and/or administrative practices encourage anti-selection
- Sensitivity testing – Must evaluate materiality of alternative assumptions, update as appropriate, and, for flexible premium policies, evaluate specific and other relevant premium scenarios

Expense Assumptions

- Fully allocated
- Include taxes, licenses & fees
- Do not include federal income taxes
- IT development costs and other capital expenditures may be spread over a reasonable number of years
- Assume the company is a going-concern
- Shall be related to appropriate basis, such as per death incurred, per policy inforce, etc.
- Must reflect inflation
- Shall not assume future improvements
- Shall be consistent with other assumptions
- Old policy assumptions need to be consistent with new business assumptions
- Add appropriate margins

Step #2 – Determine Deterministic Reserve Assumptions

- Interest rate movements
  - Begins with market yield curve on the projection start date
  - Ultimate curve is based on 65 CTE statistics obtained from the recalibrated C3 Phase 1 generator
  - Rates linearly progress to ultimate rates
- Prescribed S&P 500 returns and separate account fund performance – Begins with current 10-year Treasury rate and progress to ultimate 10-year Treasury rate per the CTE statistics, in the same manner as for the interest rate movements
- Net spreads
  - Starting assets
    - Market experience for default costs, unless company can justify other
    - Margins should be higher when there is greater uncertainty, volatility, or limited experience
  - Reinvestment assets – Prescribed net spread equal to risk-free based rate plus x% fixed spread (TBD)

Step #3 – Determine Stochastic Reserve Assumptions

- Interest rate movements
  - AAA C3 Phase 1 interest rate generator, or
  - Prescribed set of scenarios determined by NAIC, or
  - Proprietary scenario sets (calibrated), or
  - Interest rate generator developed by the company (calibrated)
- Equity return paths
  - Prescribed equity return generator, or
  - AAA pre-packaged scenarios, or
  - Proprietary scenario sets (calibrated), or
  - Equity return model developed by the company (calibrated)

Step #4 – Calculate Deterministic Reserve

- Seriatim approach based on a projection of cash flows over a single scenario, using PEA for assumptions that are not prescribed
- Per policy reserve is equal to the greater of the seriatim reserve and the cash surrender value, adjusted for reinsurance
- Seriatim reserve – Gross premium valuation ("GPV") methodology
  - \+ Present value of future benefits
  - \+ Present value of future expenses
  - \+ Policy account value invested in the separate account
  - \+ Policy loan balance
  - \- Present value of future gross premiums
  - \- Present value of future net cash flows from the general account
  - \- Present value of future net policy loan cash flows
  - \- Present value of net reinsurance discrete cash flows
  - \- Present value of net reinsurance allocated cash flows
  - \- Present value of future derivative liability program net cash flows
- Deterministic reserve is the sum of the per policy reserve for all policies

Step #5 – Stochastic Modeling Exclusion

- Companies that qualify, may exclude some business from calculation of stochastic reserves
- If qualifies, reserve Modified Deterministic Reserve, "MDR" is equal to the sum of:
  - GPVAD (defined later) using valuation assumptions and cash flows used to determine deterministic reserves
  - Per policy deterministic reserves
- Exclusions
  - Demonstrate that MDR provides for all material risks, or
  - Pass the stochastic exclusion test

Stochastic Exclusion Test

- Based on 16 deterministic scenarios
- Calculate GPAVD for each scenario
- For new block of business, calculate GPV
- Base scenario assumes that all future interest shocks are zero (level scenario)
- Test (test value TBD)
  - HSR – Highest scenario reserve
  - BSR – Base scenario reserve
  - PVP – Present value of premiums

$$\frac{HSR - BSR}{BSR + PVP}$$

Calculate Stochastic Reserve
Greatest Present Value of Accumulated Deficiency ("GPVAD") Approach

- At the end of each projection year and the model start date calculate for each scenario:
  - Net accumulated asset amount
  - Accumulated deficiency – Negative of net accumulated asset amount for each model segment
  - Discounted value of accumulated deficiency as of the projection start date for each model segment
  - Reserve is equal to the sum of:
    - Deterministic reserve
    - Maximum of the discounted value of accumulated deficiencies (positive or negative)
- Rank the scenario reserves from lowest to highest
- Calculate the average of the highest x% of the scenario reserves (TBD)
- Add, if necessary, an amount to capture any material risk not already reflected

Other Issues

- Much still being debated
- Software still under development
- What is annual statement presentation of assumption changes
- Reinsurance
- Margins
- Projection start date – up to 3 months prior to valuation date
- Quarterly calculations
- What do projected earnings look like – SOA project

Section 4

Online Resources

Important Online Resource Links

- Academy of Actuaries
  - C3 Phase II RBC & Reserves Project: **http://www.actuary.org/life/phase2.asp**
  - Core Principles: **http://www.actuary.org/pdf/life/consistency_sept07.pdf**
  - Life Capital Work Group Update: **http://www.soa.org/files/pdf/2008-qc-boyko-dirico-06.pdf**
  - Principles-Based Project: **http://www.actuary.org/risk.asp**
- Actuarial Standards Board (Discussion Drafts)
  - Standards for Independent Review: **http://www.actuary.org/pdf/life/asb_review_may07.pdf**
  - Standards for Reserves: **http://www.actuary.org/pdf/life/asb_reserves.pdf**
- NAIC
  - Capital Adequacy Task Force: **http://www.naic.org/committees_e_capad.htm**
  - Life & Health Actuarial Task Force: **http://www.naic.org/committees_lhatf.htm**
  - Principles-Based Reserving Working Group: **http://www.naic.org/committees_ex_pbr_wg.htm**
- Society of Actuaries
  - *The Financial Reporter* – Karen Rudolph: **http://www.soa.org/library/newsletters/financial-reporter/2008/march/frn-2008-iss72.pdf**
  - *Small Talk* – Norman Hill: **http://www.soa.org/library/newsletters/small-talk/2008/june/stn-2008-iss30-hill.pdf**
  - *Taxing Times* – Christian Des Rochers: **http://www.soa.org/library/newsletters/taxing-times/2008/may/tax-2008-vol4-iss2-desrochers.pdf**

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