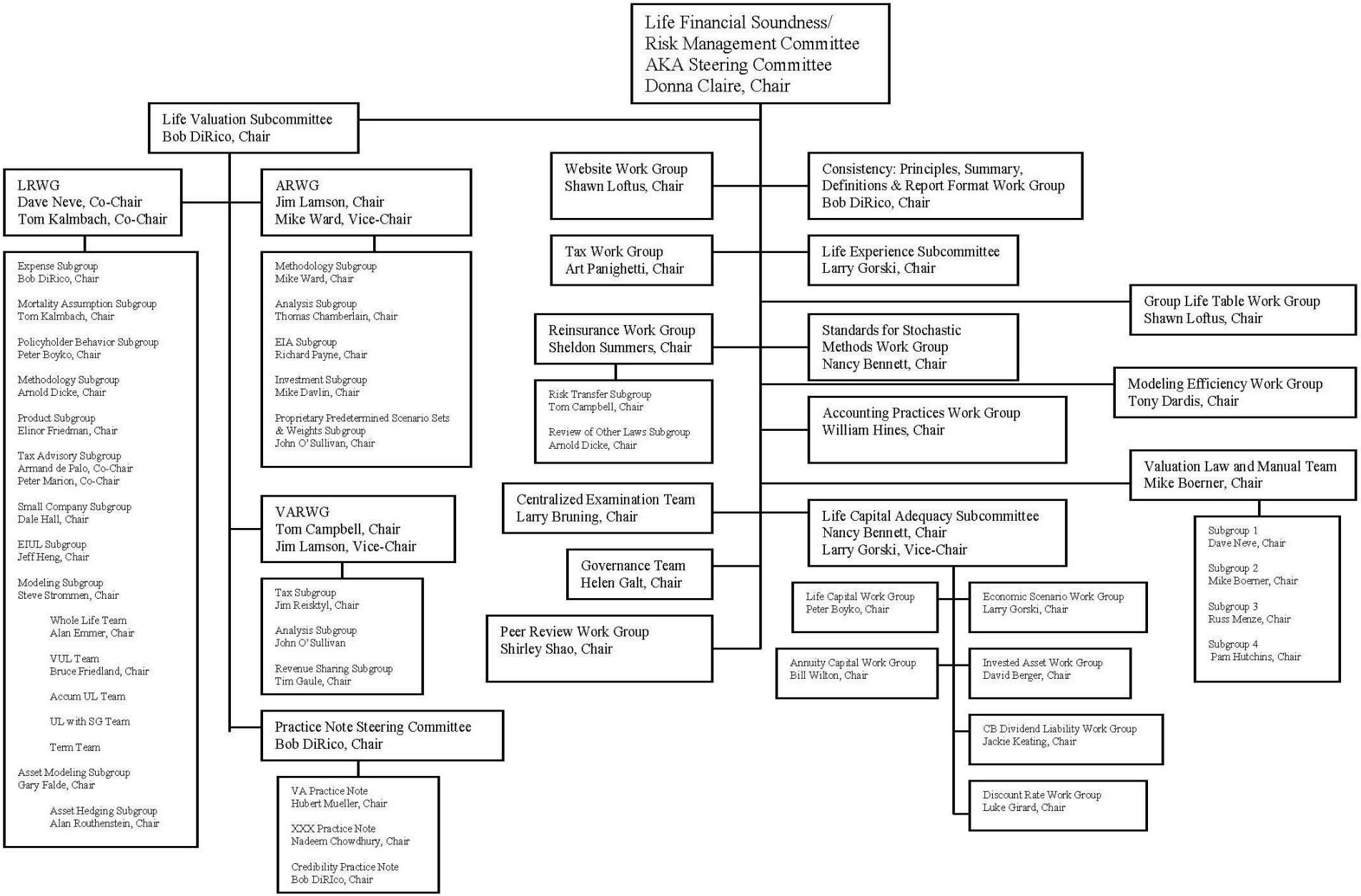
SVL2/PBA

Donna Claire, F.S.A., M.A.A.A.
Chair, Life Risk Management and Financial Soundness Committee (AKA PBA Steering Committee)

Presentation to LHATF June 1, 2007



Overview

- Academy is working on technical issues
- LHATF SVL2 group working on law
- PBA (EX) group working on all NAIC issues
- Coordinated effort
- Most technical work done in 2007

NAIC PBA (EX) group

- Big picture issues
- What NAIC groups need to be involved?
- Coordination with international activities
- Meeting Sunday 8-9am

Coordination Efforts with Other Lines

- Life furthest along
- Annuity will be done this year
- Health working hard: LTC 1st, others also following
- Coordination/information sharing with P&C (e.g., Centralized Review Team effort)

Possible Overall Timetable

- Technical work completed in 2007
- Life Risk-Based Capital Report exposed this year, adopted for year-end 2008
- Education, feedback NAIC and industry 2007-2008
- Passing SVL 2007/2008, state adoption 2009; implementation 1/1/2010

Volunteer Effort

- Hundreds of volunteers
- Major time commitment
- Work includes: profession, regulators, NAIC staff, industry

Today's Agenda Regarding PBA

- General PBA topics
  - Overview, summary of non-reporting groups
  - Capital
  - Economic scenarios
  - Reinsurance
  - Preferred Mortality
- LRWG
- LHATF's SVL2
- Valuation Manual
- VACARVM

PBA Steering Committee

- Donna Claire, chair
- Weekly calls
- Coordinates all the life and annuity reserve and capital work; liaisons with health, international, ASB
- Sets direction; discusses/settles issues where groups may have disagreement
- Makes sure all topics are being covered

Consistency Group

- Robert DiRico, chair
- Has representatives from reserves and capital groups
- Developed current definition of principles-based approach
- Assures consistency of:
  - Definitions
  - Direction
  - Reports

Tax Work Group

- Art Panighetti, chair
- Provides guidance on US tax code implications
- Has dotted lines to product-specific tax groups under LRWG, VARWG

Website Work Group

- Shawn Loftus, chair
- Works with Academy staff to get documents up to website:
- www.actuary.org/risk.asp

Corporate Governance Group

- Helen Galt, chair
- Defines the aspects of the company (i.e., board, senior management, appointed/PBA actuary) that would be responsible for corporate governance of PBA and what roles each would have
- Determines if additional certifications good/needed

Objectives of Corporate Governance Work Group:

- To support a reserve and capital determination process that meets the ultimate solvency objectives of statutory accounting
- To assure compliance with the letter and spirit of the law(s), regulations, and other regulatory guidance surrounding PBA
- To clarify accountability with respect to roles and responsibilities within a company related to PBA reserves and capital.

Objectives of Corporate Governance Work Group (cont.)

- To assure appropriate coordination / alignment with other internal management processes like the company's risk management processes.
- To assure auditability of results.
- To assure proper disclosure in statutory financial reports and other public documents about the company's reserves and capital.
- To assure that an appropriate internal control structure exists, so that the company can comply with the preceding objectives.

Centralized Review Team

- (Larry Bruning was chair)
- Goal is to determine what is best regulatory oversight methodology
- Have been helped with feedback from P&C actuaries regarding their experience with PBA

Peer Review Group

- Shirley Shao was chair
- Group has issued report, and possible guideline was exposed by LHATF
- Work moved to Valuation Manual Team

Standards for Stochastic Methods

- Chair: Nancy Bennett
- Goal: Recommend the most appropriate method for supporting the use of stochastic interest rate and equity generators for the purpose of calculating capital charges and reserves using a stochastic methodology (i.e., principles-based life and annuity reserves)
- Group issued report; recommended both a prescribed (ESWG) generator plus allowance of company-specific generators if they meet calibration criteria

Model Efficiency Group

- Tony Dardis is chair
- Goal is to develop methods to improve run times/reduce costs of models
- Relatively new group – volunteers welcome!

Accounting Practices Work Group

- William Hines is chair
- Is determining what Blanks changes may be needed
- Is also working on interrogatories/ disclosures that may be needed in Annual Statement

Credibility Practice Note Group

- Robert DiRico is chair
- Group also contains academics
- Purpose is to help actuaries determine when own experience is credible

Highlights of Academy PBA Efforts

- Many projects in or near final stages
- Major outstanding effort now the Valuation Manual
- Life Capital has an exposure out for comment – can be passed this year, implemented next year
- PBA reviewer regulation exposed by LHATF; being incorporated into Valuation Manual

Actuarial Standards Board

- Discussion drafts of two potential ASoPs regarding PBA are available
  - Each is an illustration of what might be done
  - Not reviewed or approved by the ASB
    - Developed by Task Forces of the LOC
  - Not Exposure Drafts
  - Based on current state of proposals
  - Works in progress!

Annuity Reserve Work Group

Jim Lamson, Chair

Mike Ward, Vice-Chair

Progress on ARWG Portion of Valuation Manual

- Great deal of progress made
- Patterned after earlier version of LRWG VM Draft with differences:
  - Scenario Reserve Definition
  - Working Reserve
  - Stochastic Modeling Exclusion
  - Treatment of Separate Account Business
  - Mortality and Contractholder Behavior Assumptions

Differences from LRWG VM

- Scenario Reserve defined as book value of smallest asset portfolio needed to ensure no deficiencies
  - A number of methods could potentially be used to approximate the scenario reserve
  - GPVAD method is one such method
  - Have not yet developed acceptance criteria for approximation
- Working Reserve (current thought):
  - Cash surrender value on deferred annuities
  - Either zero or discounted value of income payments for immediate annuities

Differences from LRWG VM

- Stochastic Modeling Exclusion
  - Trying to develop a "principles-based" set of requirements for actuary to follow
  - No "bright line" – requirements are still to be developed and we are reviewing
    - LRWG guidance
    - That contained in the Canadian Standards of Practice, and
    - Other sources

Differences from LRWG VM

- Deterministic Reserve
  - No significant amount of work done toward development
- Treatment of Separate Account Business
  - Consideration being given to allowing aggregation across all General Account and Separate Account business within scope
- Mortality and Contractholder Behavior Assumptions
  - Changes made that reflect annuity business rather than life insurance

Analysis Subgroup

Comparison of results from five actuarial modeling systems:

- Each system designer has made reasonable default assumptions in system development
- Getting each system to "behave" the same can be challenging
- Numerical differences arise due to different system designs
  - Differences being narrowed considerably by fine-tuning
  - Default actuarial and investment assumptions and their impacts being documented and quantified

Analysis Subgroup (cont.)

- Scenario reserves based on the GPVAD approximation are being compared for several scenarios
- Stochastic results expected by Fall LHATF meeting

Risks in Non-variable Annuity Reserves

- ARWG working closely with Consistency Work Group, VARWG and LRWG
- Developing consistent statement of guidance to the actuary
  - Risks included
  - Risks excluded

Webcast

- Next webcast: June 20, 2007 from noon to 1:30pm EDT
  - Fee is $160 for participants and free for regulators and WG members
  - Speakers: Mike Boerner, Tom Campbell, Dave Neve, Jim Lamson, Sheldon Summers
  - Register at www.actuary.org

Summary

Yes, it is a marathon – BUT WE CAN, AND ARE DOING IT!!!!

Principles-Based Update: Capital Requirements

Chairs of Academy Groups

- **Nancy Bennett**, chair of the Life Capital Adequacy Subcommittee
- **Peter Boyko**, chair of the Life Capital Work Group
- **Bill Wilton**, chair of the Annuity Capital Work Group
- **Max Rudolph,** chair of the Economic Scenario Work Group

Life Capital Adequacy Subcommittee

- Under Nancy Bennett, this group handles all questions related to Life Capital for the Academy, including PBA
- Works closely with Philip Barlow's NAIC Life RBC committee

Life Capital Work Group

Peter Boyko, Chair

LCWG Charge

- The charge of the Academy Life Capital Work Group is to review and evaluate the interest rate and market risk (C3) component of the current Life Risk-Based Capital framework in the context of life products valued under a principles-based reserving approach. The Academy's Life Capital Work Group will work with the Academy's Life Reserve**s** Work Group and Life Capital Adequacy Subcommittee and recommend changes to the Life Risk-Based Capital formula, as necessary.

LCWG Charge

- Is working with the Academy's Life Reserves Work Group and Life Capital Adequacy Subcommittee.
- Scope of the work does not include review of C1, C2 or C4 components.
- C3P3 Project seen as next step toward a future comprehensive Principles-based approach to capital.

LCWG Work to Date

- Initial Presentation to NAIC — Sept. 2006
- Presentation to NAIC — Dec. 2006
  - Update on framework and initial report
- Updated Report submitted to NAIC — Mar. 2007
- Life RBC Work Group conference call — Mar. 30, 2007
  May 29, 2007
- Updated Report submitted to NAIC — June 2007
- Materials found at www.actuary.org/risk.asp

LCWG Recommendation: Scope

- Rules will apply to all life insurance products inforce. No restriction to those policies in Life Reserves Work Group (LRWG) scope.
- Recommend:
  - Inclusion of Single Premium Life business in C3P3 and removal from scope of C3P1
  - Eliminate current C1 required capital on expense allowance for variable products within scope
  - Eliminate current C1cs amount on equities inforce at the valuation date which back the life product reserves
  - Allocation of C3 RBC amount into interest rate and equity/market risk components, combined with existing C3a and C3c components respectively

LCWG Recommendation: Calculation Basis

- C-3 Component of Risk-Based Capital = TAR - reserve
- TAR recommended to be set at CTE(90) consistent with risk level set for other products.
- TAR is an after-tax calculation reflecting stochastic interest rate and equity scenarios.
- TAR calculated as the Greatest PV of Accumulated Deficiency calculation.

LCWG Recommendation: Calculation Basis (cont'd)

- Discount rate consistent with C3P2.
- Working Reserve
  - Use estimate of projected reserve where estimate consistent with actual reserve at projection start date
    - May be CSV for products having cash values, or
    - Present value of expected benefits and expenses less premiums for products without cash values
- Tax Adjustment per C3P2

LCWG Recommendation: Calculation Basis (cont'd)

- Scenarios consistent with other PBA projects
- Reflect company investment / disinvestment strategy
- Prescribed spreads on reinvestments
- Revenue sharing consistent with C3P2
- Alternative Amount – exclusion from stochastic scenarios

LCWG Recommendation: Scenarios

- Scenarios, at option of actuary, may be generated from:
  - Academy supplied generator [C3P1 update recommended],
  - Academy supplied scenarios with scenario picking tool, or
  - Proprietary generator, subject to calibration criteria established by Academy Economic Scenario Work Group

LCWG Recommendation: Assumptions

- Projections reflect Prudent Estimate assumptions.
  - Report contains guiding principles underlying the determination of Prudent Estimate assumptions.
  - For policies valued under LRWG requirements, would use same Prudent Estimates as for LRWG reserves.
  - For policies not valued under LRWG requirements, desirable that Prudent Estimates consistent with degree of conservatism in reserves.
  - Breadth and venue as to guidance regarding determination of Prudent Estimate assumptions under development.

LCWG Recommendation: Assumptions (cont.)

- Asset Projections
  - Starting Assets are set equal to reserve.
  - Reflect Company's reinvestment & disinvestment policies.
  - Spreads on reinvestments prescribed by NAIC, consistent with LRWG proposal.

LCWG Recommendation: Assumptions (cont'd)

- Treatment of Hedges
  - Will be directly reflected in the C3P3 calculation, based on existing C3P2 framework
  - Consistent with Dec. 2006 LRWG requirements

LCWG Recommendation: Documentation and Certification Requirements

- Documentation Requirements consistent with C3P2
- Certification of C3 Amount Determined
- Supported by a Report

Key Differences from LRWG

- Applies to all inforce individual life insurance policies.
- No dual-track greater-of calculation.
- Working Reserve definition
- Stochastic modeling exclusion
- Reinsurance Credit
- After-tax
- Amount Allocations
- Independent Review

LCWG Timeline – to come

- By Sept. 2007
  - Provide Preliminary Modeling results
  - Close the C3 formulation issue
  - Address the Reinvestment Spreads Issue
- Prior to Dec. 2007
  - Have any Necessary 2008 LRBC Instruction changes drafted and approved
  - Possibly Address Allocation of the reported Amount between C3a and C3c
  - Possibly Address the Issue of Multiple reports / timing
- YE-08 Effective Date

Annuity Capital Work Group

Bill Wilton, Chair

AMERICAN ACADEMY of ACTUARIES

ACWG Project Objective

- Implement PBA to quantify C3 for annuity and similar products
- Implement under one framework Phase I, Phase II, and bring in equity-indexed annuities.
- Ideally, annuity and life can be under a consistent framework for C3.

ACWG – Issues from LRBC

- Are current factors for C3 still appropriate or should they be revised?
- Should the cap on C3 Phase 1 (200% of factors) be eliminated? Academy believes floor should also be reevaluated.
- Should the current weighted factor approach for C3 Phase 1 be replaced with a CTE-type approach?

ACWG Working Construct

- Stochastic interest rate and / or equity return scenarios
- Calculate Asset Requirement for each scenario.
- Conditional Tail Expectation (CTE) risk measure is used to set Total Asset Requirements (TAR).
- C3 component of Risk-Based Capital is calculated as the difference between CTE 90 TAR and the CTE 65 TAR.
- An alternative method not involving stochastic projections may be permitted to establish TAR for some products.

ACWG Working Construct (Cont.)

- The C3 component is to be split between interest rate risk (C3a) and market risk (C3c).
- Risk-based Capital will have an additional adjustment for the difference between reserves and the CTE 65 Total Asset Requirement.

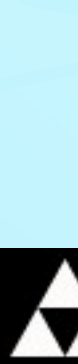
$$RBC = C0 + C4a + \sqrt{(C1o + C3a)^2 + (C1cs + C3c)^2 + C2^2 + C3b^2 + C4b^2} - (Reserves - CTE_{65}TAR)$$

ACWG Implications

- Bring in equity-indexed annuities
- C3 Phase I – CTE approach replaces current approach
- C3 Phase II – many similarities, update to continue movement towards PBA and establish consistency with reserve work groups
- Market Risk – Some risk (e.g., Common Stock) currently included in C1, proposed to be moved to C3c

Economic Scenario Work Group

Max Rudolph, Chair



AMERICAN ACADEMY of ACTUARIES

Two Main Issues re: Interest Rate Modeling for real-world PBA

- Update the "C-3 Phase I RBC" Stochastic Log Volatility (SLV) model
- Establish "calibration criteria" to govern principles-based valuation (reserves and capital)

Update the "C-3 Phase I RBC" Stochastic Log Volatility (SLV) model

- Refresh the parameterization using monthly Treasury data from 1953 – 2006
- Simplify or expand the model to improve "fit" or to achieve desirable characteristics
- Establish processes (formulas) for automatically updating non-stable parameters
  - Mean reversion parameter ("MRP") for long interest rate (20 year yield) – i.e., target rate
  - Starting volatility for the SLV process (that governs evolution of the log long rate)
- Overhaul the Microsoft Excel "generator" for broad distribution to the industry
- Document the model, data sources, key decisions and parameters

Progress on Model

- The SLV model has been updated along a number of dimensions
  - Starting volatility for log long rate process is standard deviation of prior 14 months (excluding highest and lowest values)
  - Target τ_1 for long rate is 0.5 × (M – 25 bps) + 0.5 × A, rounded to nearest 25 bps, where

    M= median 20-year yield over preceding 600 months (50 years)

    A= arithmetic average 20-year yield over preceding 36 months
  - The rest of the yield curve is based on the relationships from the "best fit" historic curve

Reparameterization Phase

Significant changes from current

- Target (mean reversion) long rate – 6.55% vs. updated rate of 5.5%
- Time step of the long rate volatility
- Formula to update target long rate
- Formula to update starting value for long rate volatility process
- Volatility of long spread process is dynamic
- Change process to complete the yield curve

Establish "Calibration Criteria" to Govern PBA valuation (reserves & capital)

- Subject to the requirements, companies will be able to use their own IR models
- Objective – allow reasonable and appropriately parameterized models to "pass"
- Criteria should be dynamic and not require frequent revision by the Academy
- Standards will include qualitative and quantitative requirements
- Justify the criteria – need not be a rigorous, statistical defense

Calibration Criteria

- By definition, we will assume that the SLV model is “calibrated” (i.e., safe harbor)
- Key idea is develop “acceptable tolerances” around the SLV statistics – this will ensure that the calibration criteria remain dynamic and relevant in the future
- Currently, we look at the following statistics:
  - Various percentiles for long, short and spread distributions at 1, 5, 10 and 30 year horizons
  - Standard deviation of changes in log rates
  - Correlations between long and short rates
  - Frequency of curve inversions

Open Questions

- How should the tolerances be developed?
- How should the tolerances be expressed? (e.g., ratios, bps deviations, etc.)
- Must all the criteria be satisfied, or should we widen the acceptable tolerances?
- What other models should be examined to determine reasonable deviations?
- Should we instead use a bootstrap technique to (a) develop the tolerances and (b) justify the SLV parameterization?
- What if the SLV model needs adjustment – how should this decision be made?

New Economic Scenario Generator

- Will be ready by September NAIC meeting
- Calibration criteria will also be finalized

Reinsurance

Sheldon Summers, Chair

of the Academy's Life Reinsurance Work Group

What is in latest LRWG draft?

- A method for allocating reinsurance aggregate cash flows and for adjusting the cash surrender value floor for reinsurance.
- Example: a reinsurance treaty has non-proportional features such as an experience refund.
- Method applies to both assuming and ceding companies.

What is in latest LRWG draft?

- Assumptions used by assuming company need not be the same as those used by ceding company.
- Reliance on reserve calculation of other party is permitted but adjustments required to reflect circumstances of first party.

What is in latest LRWG draft?

- For reinsurance ceded, cash flows between the parties are taken into account when reinsurance agreement does not meet the requirements for accounting as reinsurance only if doing so has the effect of increasing reserves.

What is in latest LRWG draft?

- For reinsurance assumed, cash flows between the parties are taken into account whether or not the reinsurance agreement meets the requirements for accounting as reinsurance.

What is in latest LRWG draft?

- When assets are held by other party, the notional gross reserve is calculated under assumptions that represent what experience would be in the absence of reinsurance and the business was managed in a manner consistent with how retained business is managed.

What is in latest LRWG draft?

- The assumption is made that counterparties are knowledgeable about contingencies in reinsurance agreement and will exercise terms to their respective advantage.

What is in latest LRWG draft?

- Considerations in deciding whether to model assets in possession of other party (such as in Mod-Co arrangements).
- Considerations if assets in possession of other party must be modeled.

What is in latest LRWG draft?

- If reinsurer is known to have a financial impairment, then a margin for default shall be included in assumptions used by ceding company.
- If ceding company is known to have a financial impairment, a margin may or may not be necessary in assumptions used by assuming company.

What is still pending?

- Additional guidance in allocating net reinsurance aggregate cash flows and in adjusting the cash value floor when multiple policies apply to a policy and to address pure non-proportional agreements.

What is still pending?

- Are there any IMR related issues?
- Are there any issues unique to the reinsurance of annuities?
- Are there any issues regarding RBC that need to be addressed?

What is still pending?

- Possible requirements for stochastic modeling of mortality assumptions when reinsurance has a disproportionate impact on tail risk.
- Risk transfer requirements.

Risk transfer

- Existing requirements:
  - Reinsurance accounting not permitted if surplus may not be permanent under conditions not under the control of the ceding insurer.
  - Reinsurer is to “step into the shoes” of the ceding company.

Risk Transfer

- Current thoughts of Risk Transfer Subgroup:
  - Under PBR, no penalty should apply if provision can be modeled.
  - Under PBR, a penalty may apply if provision cannot be modeled or if provision presents a public policy concern.

Risk transfer

- Current thoughts of Risk Transfer Subgroup:
  - Issue of “penalty” is currently under discussion.
  - Elimination of deposit accounting as consequence of having a non-complying treaty.

QUESTIONS?