

# PBR – Regulatory Update and Implementation Challenges

Jason Kehrberg, PolySystems

Actuaries' Club of the Southwest  
Spring Meeting – June 25, 2015



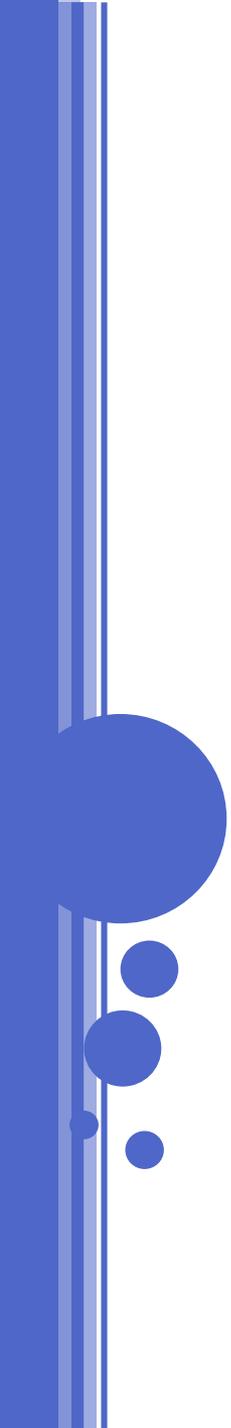
**PolySystems, Inc.**  
Actuarial Software & Data Solutions

# Agenda

---

- Brief Overview of PBR
- Regulatory Update
- Implementation Challenges





# Brief Overview of PBR

# Why PBR?

---

- Reserve methodology fundamentally unchanged for 150 years
- Products have grown in complexity due to consumer demand, technology and regulatory changes, and are often paired with complex assets and hedging strategies, resulting in very firm specific risk profiles on both sides of the balance sheet
- These new products don't lend themselves to a fully prescribed, "one size fits all" reserve methodology
  - Limits consideration of product risk drivers
  - Ignores firm-specific risk management practices
  - Requires legislative action for reserving adjustments
  - Restricts the use of actuarial judgment
  - Uses prescribed, deterministic assumptions
- Resulting reserves are often too conservative or not adequate



# Regulators and industry generally support PBR

---

- Regulatory “quick fixes” (e.g. XXX, AG 38) have been less than optimal, often leading to more complicated products designed “around” the fix
- Regulators have started to make use of principle-based approaches, but in piecemeal fashion
  - C3P1 (2000)
  - C3P2 (2005)
  - VA CARVM (2009)
  - AG38 8D and 8E (2012)
  - AG48 (2015)
- Industry hopes PBR will address statutory reserve redundancies
  - Level premium term
  - Universal life with secondary guarantees
  - Fixed indexed annuities with GLIBs



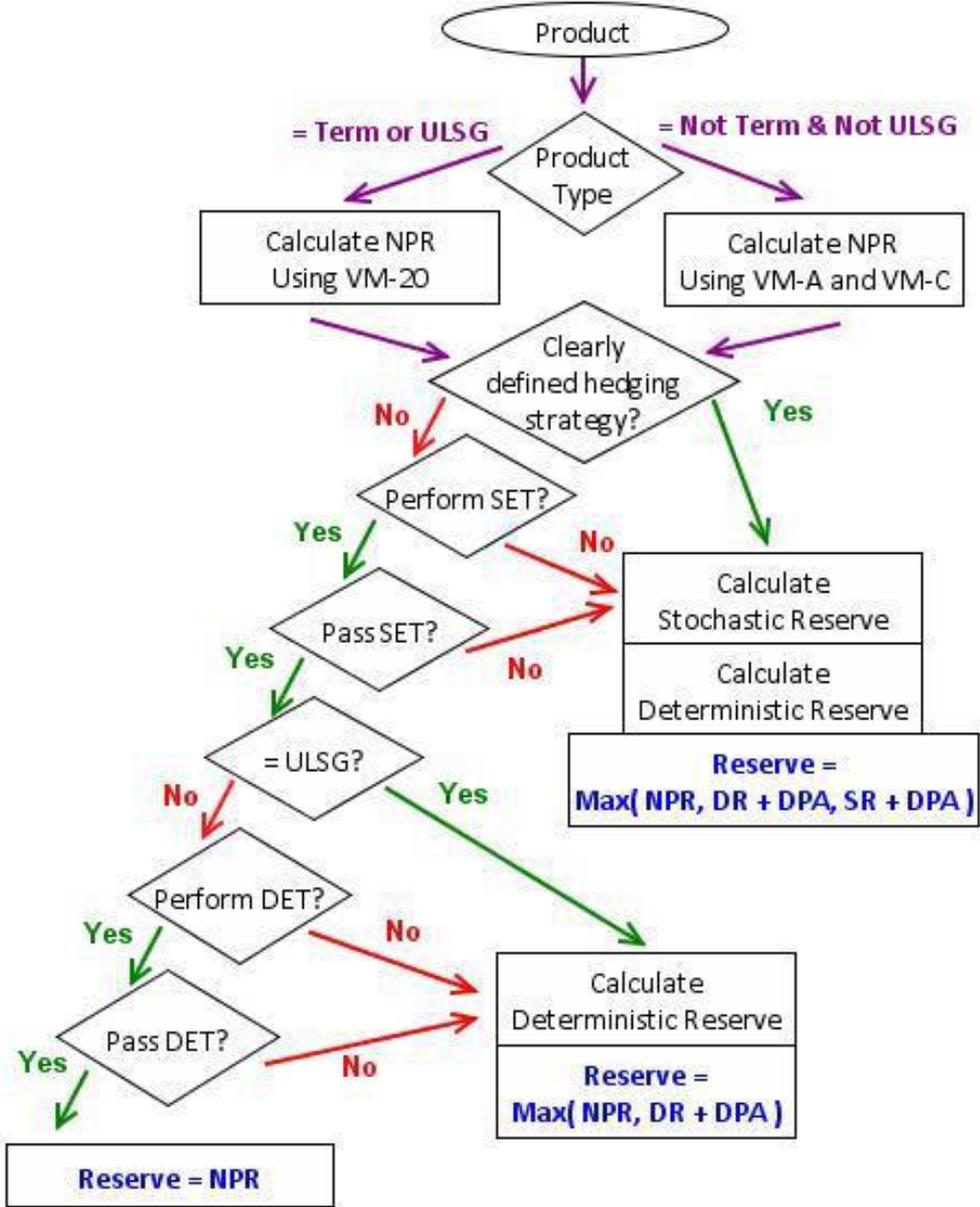
# The new valuation manual (VM)

---

- Rather than continue to introduce PBR in piecemeal fashion, in 2012 the NAIC adopted an overhaul of the VM, and importantly, the process by which future changes are made to it
  - New SVL references the new VM; no more state adoption of model rules
  - LATF will maintain the new VM and will use its amendment proposal form as the official process for raising issues and suggesting changes
  - Amendments will be put on LATF's pending list, and if accepted will then be classified as Substantive, Non-Substantive, or Update to a Table.
- The new valuation manual introduces PBR for life products (VM-20), experience and financial reporting requirements for business subject to PBR, and corporate governance requirements for PBR
- Although perfection is not required, progress has been slow due to the many stakeholders involved in the process



# VM-20 chart from SOA PBA Implementation Guide



# The VM-20 Deterministic Reserve

- $DR = PV(\text{benefits} + \text{expenses} - \text{premium} - \text{net GA/SA transfers} - \text{net policy loan CF} - \text{net reinsurance CF} - \text{net derivative liability program CF}) + SA_0 + LB_0.$ 
  - Benefits – are before netting the repayment of any policy loans and include, but are not limited to, death and cash surrender benefits.
  - Expenses – exclude federal income taxes and expenses paid to provide fraternal benefits in lieu of federal income taxes.
  - Policy loans – include only if explicitly modeled.
  - Premium – gross premium and includes other applicable revenue.
  - Net reinsurance CF = net reinsurance discrete CF + net reinsurance aggregate CF.
  - $SA_0$  = policy AV invested in the SA at the valuation date.
  - Discount rate = net investment earnings / invested assets

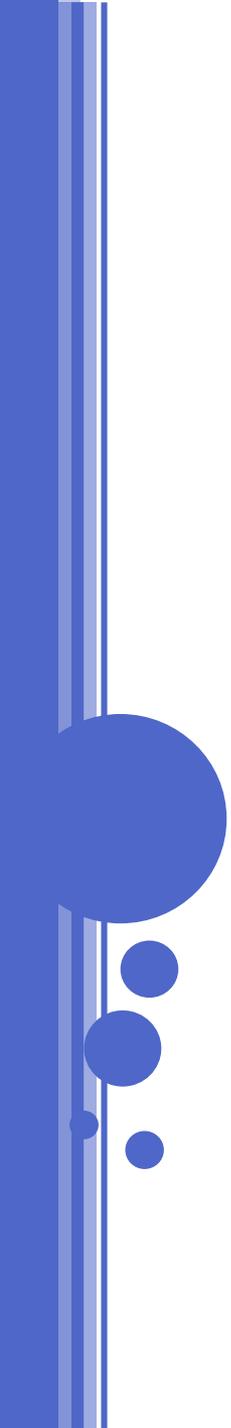


# The VM-20 Stochastic Reserve

---

- CTE 70 of greatest present value of accumulated deficiencies, captures tail risk
- Calculated in the aggregate, allowing for risk offsets
- But floored by the NPR and DR
- Iterate until within 2% of starting assets
- Requires an asset-liability model
- Actuary must determine if any additional reserve amount is required to capture material risk not captured elsewhere
- Model compression is allowed





# Regulatory Update



# New York reservations

---

## ○ Actuarial issues

- Level of conservatism in mortality, asset credit quality, and post level term period profits
- Prefer seriatim calculations for auditing
- Prefer focus to be on best estimate assumptions rather than margins

## ○ Superintendent issues

- PBR in banking didn't work; not sure it's the answer for insurance
- Reserves decrease → insolvency increases
- Unclear whether prices will decrease
- Regulators relatively ill-equipped for PBR
- Want 3+ years of parallel testing

## ○ NY recently issued its own proposals for Term and ULSG



# Are regulators ready for PBR?

---

- The NAIC has developed a PBR Implementation Plan outlining additional regulatory actions to successfully implement PBR
  - Additional staffing, regulator training, and formation of PBR VAWG
  - Changes to statement blanks, financial analysis tools, and review process
  - Company outreach – surveys, pilot study, company training
  - VM adjustments
    - Update date/tables (e.g. 2014 VBT, spreads, defaults), recalibrate ESG
    - Finalize VM-31 (documentation) and VM-50/51 (experience reporting, incl. LTC)
    - Clarify which life products are subject to VM-20 Section 3 Net Premium Reserve
    - Consider accounting methodology to address PBR reserve volatility
    - Develop PBR for non-variable annuities (VM-22) and health insurance (VM-25)
  - Reevaluate RBC requirements in light of the new VM including consideration of Total Asset Requirement (TAR) and stress scenarios
  - Feedback loop for continuous review, assessment, improvement



# VM-20 amendments adopted by LATF

---

- Industrial life now exempt like credit life and pre-need
- Modeled reserve exemption for small companies
- CFT assumptions approved for use in stochastic reserve exclusion test, and test statistic threshold increased from 4.5% to 6.0%
- Eliminated some VM-31 documentation requirements
- Clarified modeling of policy loans
- Added alternative “direct iteration method” for calculating the DR
- NPR calculated per VM-A and VM-C applies to basic reserve only
- Modeled reserves cash flows include due premium
- Mortality credibility start date changed from 1/1/15 to 1/1/17
- Added basis for determining PBR rating for commercial mortgages



# Other VM-20 changes under consideration

---

- VM-20 Aggregate margins
- Reserve volatility
  - Potentially revise economic scenario generator
  - Accounting methodology to smooth reserves
- Change in reserve basis
  - VM-20 minimum reserve = NPR + any excess due to modeled reserves
  - Modeled reserves should not be considered change in basis except in unusual circumstances
  - Formulaic reserves should continue to apply current standard and process
- Clarification on which term and ULSG products require new NPR
- 2008 → 2014 VBT



# Update on VM-22 for non-variable annuities

---

- Final reserve = max (Floor Reserve, Modeled Reserve)
- Goals for VM-22
  - Replace poor AG33 reserves for GLIBs
  - Consistent with existing PBR methodologies
  - Reflect all key risks and handle complex designs
  - Manageable (auditable, explainable, run time, work with AAT)
- Updates from Academy's ARWG
  - Settled on 3 benefit types for the floor reserve
    - Listed benefits such as GLIBs and upper tier annuitizations
    - Rich non-listed benefits such as GMDB>AV
    - Other benefits such as surrenders, free partial withdrawals, and GMDB=AV
  - Modeled reserve methodology still needs a fair amount of work
  - Gradually getting results from Kansas' field test



# The VM-22 Floor Reserve

---

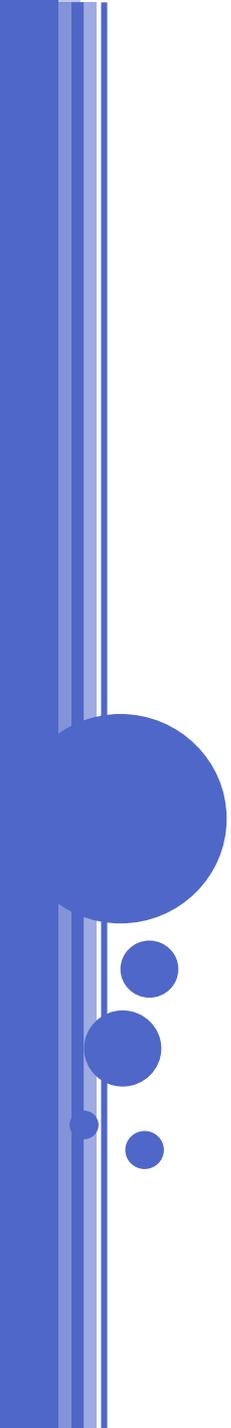
- Floor Reserve = Max ( $\alpha$ ,  $\beta$ , Cash Value)
  - $\alpha$  and  $\beta$  are greatest present values over integrated benefit streams
  - Policyholder behavior is prescribed but varies by in-the-moneyness
  - A GLIB incidence rate generator based on pricing surveys and cash flow testing assumptions will consider product design and historical rates credited to the AV and GLIB benefit base
- $\alpha$  assumes all listed benefits are terminated on the valuation date, but still considers deaths, lapses and FPWs
- $\beta$  requires calculating a present value for each listed benefit, using prescribed assumptions for the election of the listed benefit
- The tax reserve is currently expected to be set equal to the Floor Reserve



# The VM-22 Modeled Reserve

- Modeled Reserve = Current Estimate Reserve + Aggregate Margin
  - Current Estimate Reserve (GPVAD) = probability weighted average present value of projected cashflows, discounted at scenario-specific monthly portfolio earned rates
  - Aggregate margin of CTE70 on the full stochastic reserve to be approximated using representative scenario approaches
    - Cost of Capital (Transfer Value) → Margin = PV of year by year CoC
    - Confidence Level (Percentile) → Margin equates to sufficient reserve in X% of scenarios
- The goal is a reserve based on full multivariate stochastic consideration of each risk driver, not just interest and equity
  - Approximate full multivariate stochastic consideration of each risk driver by using representative scenarios for each risk driver that are probability weighted:
    - Within risk drivers based on mean/median, standard deviation, and skewness
    - Across risk drivers based on correlation matrix and/or sensitivity of reserve





# Implementation Challenges

# More governance

---

- Flexibility in assumptions, methods, and models means new obligations to appropriately govern the process (VM-G).
- Board must review summary results and process documentation and determine what additional actions, if any, are needed to rely on company's PBR processes.
- PBR assumptions, methods and models must be consistent with other company risk processes. Must certify effectiveness of internal controls with respect to PBR valuations.
- Management is responsible for providing info to the board, reviewing results, adopting necessary internal controls, and ensuring adequate and competent resources for well functioning PBR processes
- Actuaries are responsible for reviewing/approving assumptions, methods and models. They also oversee the calculation and provide a summary report to management and the board.
- Appointed actuary provides annual statement of actuarial opinion on adequacy of all reserves, PBR and formulaic.



# Expertise and resources

---

- Securing adequate expertise within your company prior to implementation may be difficult
  - Where will the additional work for PBR be performed at your company? Valuation, Modeling, both?
  - Even with the adequate expertise, implementation will be challenging
- Resources:
  - VM-20 document and related amendments
  - *ASOP, Standards for Principle-Based Reserves for Life Products*
  - AAA Practice Note
  - SOA PBA Implementation Guide
  - Webinars, seminars, conferences
  - SOA Research Study: “A Survey of Actuarial Modeling Controls in the Context of a Model-Based Valuation Framework” (15 key steps to improve the control environment)



# Data and systems

---

- Inventory existing systems currently used for valuation, CFT, planning/forecasting, etc.
  - Approximations typically used in CFT-type projections may not be appropriate for projection based valuation
- Determine what you expect to produce for PBR, e.g. NPR, DRET, SRET, DR, SR; pre-post-reinsurance; attribution analysis; documentation; frequency
- Perform dry run(s) to evaluate gaps in data, systems and controls, and gauge impact on financials and workloads
  - More than simply projecting cashflows; can you explain results?
  - Buy or build necessary systems enhancements, e.g. asset model, solving capability, CUSIP specific defaults, premium sensitivities, grid capabilities
- A good relationship with IT is key



# Assumptions and margins

---

- Importance of experience studies
  - **Your** experience studies, not regulatory prescription, will be the basis of key valuation assumptions
  - Evaluate the state of your experience studies (frequency, quality, documentation)
  - Affects best estimate assumptions as well as margins
- VM-20 mortality is particularly challenging
  - High amount of prescription
  - Prescribed method has been revised
- ULSG lapse rates are prescribed at later durations
- Relatively little guidance on margins
  - Each non-prescribed assumption requires its own margin Still not clear exactly how to handle, e.g. correlation offsets
  - Consider starting with a simple approach as rules, guidance, and industry practice evolves



# Dealing with volatility in results

---

- How do you become comfortable results are correct?
- Difficult to materially reduce volatility
  - Valuation actuaries often focus on producing results that pass a quick reasonableness check
  - Will need to be spend much more time understanding results and being able to quantify and explain changes
- Can use tools to help manage and communicate volatility.
  - Sensitivity analysis
  - Attribution analysis – requires good assumption set management and version control
  - Leverage hardware and automation – reduces runtime and leaves more time for analysis
- In general, PBR results will be more sensitive to level of integration between valuation and risk/capital management

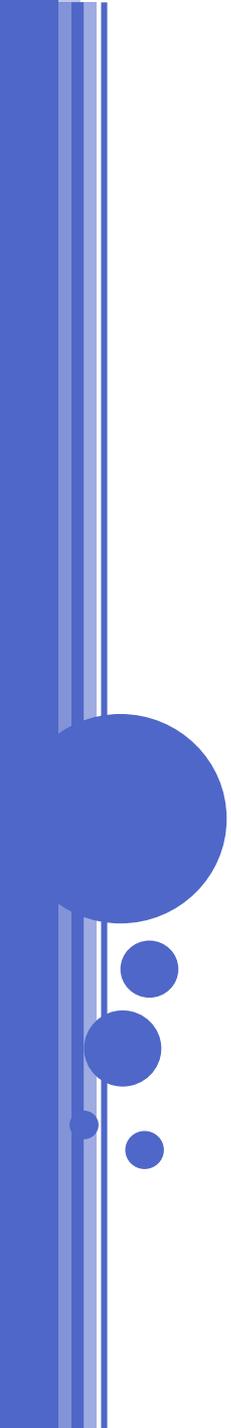


# Documenting and reporting

---

- External VM-20 documentation requirements are substantial, yet not well understood by most
  - There could be additional items eliminated from VM-31
- Internal documentation is just as important as external documentation
- Need to document the process in addition to reporting on the results
- Production reports likely to be fully automated
- May be able to leverage existing reports and reporting framework for newly required VM-20 reports
- Good version control is key





Questions?