

**Report  
of the  
Society of Actuaries  
Mortality and Other Implications of  
Principle-Based Reserving (PBR)  
Survey Subcommittee**

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## Table of Contents

Introduction .....	3
Executive Summary .....	5
Section 1 - Overview .....	7
Section 2 - Resources .....	14
Section 3 – Mortality Assumption Setting and Modeling.....	18
Section 4 – Product Development Implications .....	25
Appendix A – List of Contributing Companies .....	30
Appendix B – Mortality and Other Implications of PBR Survey .....	32

## **Introduction**

This Survey, which was conducted jointly by the Society of Actuaries' Committee on Life Insurance Mortality and Underwriting Surveys and the National Association of Insurance Commissioners (NAIC) Principle-Based Reserving Implementation (EX) Task Force, was designed to provide an overview of the current state of the industry's preparedness for implementing PBR. PBR includes law changes and a new Valuation Manual. PBR replaces the current formulaic approach to determining policy reserves with an approach that more closely reflects the risks of the products. The new calculations are expected to "right-size reserves," reducing the reserves for some products and increasing reserves for other products. The Valuation Manual provides exclusion criteria which allows simpler products, with fewer guarantees and less risk, to be subject to simpler reserving requirements.

### **Survey Scope**

The survey was conducted between April and June of 2014. Although we approached direct insurance companies, we received 53 responses, including responses from consulting firms and a reinsurer.

### **Caveat and Disclaimer**

While we anticipate and hope that the results prove useful for the industry, it should be noted that, although the data the Survey Subcommittee received was fairly comprehensive, it is by no means a look at the whole industry.

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The Survey Subcommittee would like to thank all of the respondents who participated in the Survey. We also thank those who helped us review this document and offered helpful suggestions and thoughtful comments. Finally, the Survey Subcommittee thanks the Society of Actuaries staff for their help in completing this project, especially Jack Luff and Korrel Rosenberg, without whose help this could not have been completed.

Comments about this report and suggestions for future surveys are welcome and can be addressed to the Committee on Life Insurance Mortality and Underwriting Surveys c/o The Society of Actuaries.

Mortality and Other Implications of PBR Survey Subcommittee

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## Executive Summary

The Mortality and Other Implications of PBR Survey, henceforth referred to as the “Survey,” was designed to provide an overview of the current state of the industry’s preparedness for implementing PBR and was conducted between April and June of 2014. We received 53 responses from direct life insurance carriers in the United States, consulting firms and a reinsurer. Of the 53 responses, 15 companies indicated they expected to be exempt from PBR. Thus, the questions in the Survey were answered by 38 respondents.

The Survey consisted of four sections. A brief description of each is as follows:

**Section 1 – Overview:** The purpose of the Overview section was to obtain information regarding respondents’ familiarity with PBR resources and to gauge their thoughts on whether or not PBR will meet its objectives.

**Section 2 – Resources:** The Resources section was focused on obtaining information regarding the resources, systems and staff required to implement PBR.

**Section 3 – Mortality Assumption Setting and Modeling:** The purpose of this section was to elicit information regarding the respondents’ understanding of PBR requirements related to experience studies, mortality assumptions and modeling and their plans for meeting these requirements.

**Section 4 – Product Development Implications:** This section of the Survey requested information on the potential impact of PBR for product development actuaries.

A few highlights from this report are summarized below.

### Section 1 – Overview

- The first questions in this section aimed to gauge the familiarity of respondents with PBR and the resources available to help actuaries prepare for implementation. All respondents indicated they are aware of changes to the Standard Valuation Law and the Valuation Manual. The majority of respondents indicated an awareness of the PBA Implementation Guide and exposed Actuarial Standards of Practice relevant to PBR implementation.
- Responses to other questions in this section indicated companies are early in their analysis and implementation. Many of the respondents indicated “Do not know” as their response to several questions. Also, many respondents indicated a time frame of 12 to 24 months before beginning steps necessary to implement PBR.

### Section 2 – Resources

- The Survey gathered information on the adequacy of pricing and valuation systems to perform PBR calculations. Nearly all respondents believed updates to their systems would be required to implement PBR.
- The majority of respondents indicated staffing levels would be impacted by PBR implementation, requiring additional staff, reallocation of staff or increased use of consultants.

- More than half of the Survey respondents had not yet determined the cost of PBR implementation or the expected ongoing annual costs.

### **Section 3 – Mortality Assumption Setting and Modeling**

- Most respondents anticipated changes to their companies' assumption setting process, particularly related to credibility analysis, documentation, margin setting and approval processes.
- Most companies indicated completing mortality studies at least annually and believed they were at least somewhat prepared to complete these studies to the extent required by PBR.
- More than half of the Survey respondents indicated their companies had not determined any of the pieces needed to calculate the VM-20 mortality assumption.
- Half of the respondents reported their company's modeling documentation was adequate.

### **Section 4 – Product Development Implications**

- The responses in this section of the Survey indicated a fair amount of uncertainty about the impact PBR would have on product offerings.
- Very few companies had started discussing PBR's potential impact on product design and pricing with their sales and marketing groups. A larger number of respondents (but still fewer than 40% of respondents) stated they had started discussions between the product development and valuation actuaries.

## Section 1 - Overview

The purpose of this section was to obtain information regarding respondents' familiarity with PBR resources and opinions on whether or not PBR would meet its objectives.

1. The Survey asked if respondents were familiar with the proposed changes to the Standard Valuation Law and the Valuation Manual. Thirty-eight companies responded to the question.

<b>Familiarity with Valuation Manual</b>	<b># of Respondents</b>
Very Familiar	18
Aware of Changes	20
No Knowledge	0
<b>Total # of Respondents</b>	<b>38</b>

Eighteen of the respondents indicated they were very familiar with the changes. The remaining respondents said they were aware of the changes.

2. The Survey asked if respondents were familiar with the [Society of Actuaries' PBA Implementation Guide](#). There were 38 respondents.

<b>Familiarity with Implementation Guide</b>	<b># of Respondents</b>
Very Familiar with Implementation Guide	8
Aware of Implementation Guide	29
No Knowledge of Implementation Guide	1
<b>Total # of Respondents</b>	<b>38</b>

Eight of the respondents indicated they were very familiar with the guide and 29 stated they were aware of the guide. One respondent indicated they had no knowledge of the guide.

3. The Survey asked those who responded they were very familiar with the Society of Actuaries' PBA Implementation Guide in Question 2 to indicate the case study that would be most similar to the PBR Implementation Process that was expected for their company.

Only five companies responded to this question, so we were unable to draw any conclusions. There was no indication that any had spent much time with the guide.

4. The Survey asked respondents to indicate if they read the [Actuarial Standards Board's PBR for Life Products Actuarial Standard of Practice](#) (ASOP) exposed in June 2013. There were 38 respondents, of which 26 indicated “Yes” and the remaining responded “No.”
5. The Survey asked respondents to indicate if they read the [Actuarial Standards Board's Credibility Procedures ASOP](#) (ASOP 25). There were 38 respondents, of which 33 indicated “Yes” and the remaining responded “No.”
6. The Survey asked respondents to indicate if they read the [Actuarial Standards Board's ASOP on Modeling](#) exposed in June 2013. There were 38 respondents, of which 30 indicated “Yes” and the remaining responded “No.”
7. The Survey asked respondents to indicate the steps performed to test PBR valuation. Thirty-six respondents provided answers to this question. A complete list of responses is shown in the table below:

Step	# of Responses
Participated in the New York or Kansas Experience Studies	20 (56%)
Determined which products will require Stochastic and Deterministic reserve calculations	18 (50%)
Participated in VM-20 Impact Study (Towers Watson, ACLI, other)	18 (50%)
Considered a timeline for implementation	16 (44%)
Built models and used experience to develop assumptions	13 (36%)
Performed Stochastic and Deterministic Exclusion Tests	12 (33%)
Determined which assumption needed for valuation will be company data, which will be industry -wide data and which will be blend	9 (25%)
Considered whether or not to offer only products that pass these exclusion tests after the Valuation Manual becomes effective	6 (17%)
Prepared a draft memorandum to comply with VM-31 (which includes, for example, documentation of the valuation assumptions and margins for each major product line subject to principles-based reserve valuation)	2 (6%)
None of the Above	2 (6%)
<b>Total # of Respondents</b>	<b>36</b>

Other Comments:

- *Reviewed industry study results*
- *Have done some work on updating experience studies, review of cash flow testing models and documentation of cash flow testing assumptions*
- *We have done some of the above for AG38 8D (2)*
- *Steps completed vary by product. Most testings on ULSG*

Of the 36 respondents, 20 indicated they participated in the New York or Kansas experience studies. Most of the other responses were from these 20 respondents.

8. The Survey asked respondents if, based on the NAIC objective for PBR, they believed the level of reserve under PBR would better match the level of risk for their company for the products listed below. This question received 38 responses.

<b>Product</b>	<b>Yes</b>	<b>No - Too Low</b>	<b>No - Too High</b>	<b>Do Not Know</b>	<b>Do Not Offer This Product</b>	<b>Total</b>
Term	22 (58%)	0 (0%)	6 (16%)	9 (24%)	1 (3%)	<b>38</b>
Whole Life	18 (47%)	0 (0%)	1 (3%)	16 (42%)	3 (8%)	<b>38</b>
Other UL	10 (26%)	0 (0%)	0 (0%)	19 (50%)	9 (24%)	<b>38</b>
UL w/ SG	8 (21%)	0 (0%)	6 (16%)	13 (34%)	11 (29%)	<b>38</b>
Variable Life	3 (8%)	0 (0%)	0 (0%)	17 (45%)	18 (47%)	<b>38</b>
Indexed UL	2 (5%)	0 (0%)	0 (0%)	14 (37%)	22 (58%)	<b>38</b>
Other (Single Pay Life)	0 (0%)	0 (0%)	1 (100%)	0 (0%)	0 (0%)	<b>1</b>

Overall, a number of respondents indicated “Do not know” for each product type. The following comments by product exclude those who responded “Do not offer this product”:

- Term: The majority of respondents offering term products believed PBR reserves would better match the level of risk for term products (22 of 37). Six respondents believed the PBR reserve would be too high for term plans.
- Whole Life: For the 35 respondents who offered whole life, 18 believed PBR would better match the level of risk for their company and one believed the PBR reserve would be too high. The remaining 16 respondents did not know.
- Other UL: Twenty-nine respondents offered this type of product and ten thought PBR would better match the level of risk for their company. The remaining 19 respondents did not know.
- UL with Secondary Guarantee: There was no consensus on PBR’s impact for UL with secondary guarantee products. Thirteen of the 27 who responded and offered this type of product did not know what the impact would be. Eight respondents felt PBR would be a better match; however, six thought the PBR reserve would be too high.

9. The Survey asked respondents who answered “No” for any products in question 8 to identify the reason they believed the objectives would not be achieved:

Other:

- Term: *Margins overly conservative. Should consider single margin approach.*
- UL w/ SG 1: *Margins overly conservative. Should consider single margin approach.*
- UL w/ SG 2: *Unreasonable net premium reserve, unreasonable deterministic reserve, unreasonable stochastic reserve.*

There were very few responses to this question due to the low number of “No’s” in the previous question. Term and UL with secondary guarantee products had the most respondents believing PBR reserves would be too high for the level of risk. These two product categories each had six of 38 respondents feeling the PBR reserve would be too high. For term, the reasons were split between net premium reserve, deterministic reserve and stochastic reserve. For UL with secondary guarantee, deterministic reserve was cited the most often as the reason PBR reserves may be too high for the level of risk. Of note, five of the six term writers and all six of the ULSG writers who responded “No” to question 8 participated in a VM-20 impact study.

10. If a product passes the deterministic exclusion test and the stochastic exclusion test, it will not be subject to PBR reporting (VM-31) requirements. The Survey asked respondents if they expected their company to pass both exclusion tests for any of the following products. The total number of respondents varied between 36 and 38.

Product	Yes	No	Do Not Know	Do Not Offer This Product	Total
Term	12 (32%)	15 (39%)	10 (26%)	1 (3%)	<b>38</b>
Whole Life	16 (42%)	7 (18%)	12 (32%)	3 (8%)	<b>38</b>
Other UL	8 (21%)	8 (21%)	13 (34%)	9 (24%)	<b>38</b>
UL w/ SG	0 (0%)	19 (51%)	7 (19%)	11 (30%)	<b>37</b>
Variable Life	1 (3%)	8 (22%)	11 (31%)	16 (44%)	<b>36</b>
Indexed UL	1 (3%)	7 (18%)	9 (24%)	21 (55%)	<b>38</b>
Other (Single Pay Life)	0 (0%)	1 (100%)	0 (0%)	0 (0%)	<b>1</b>

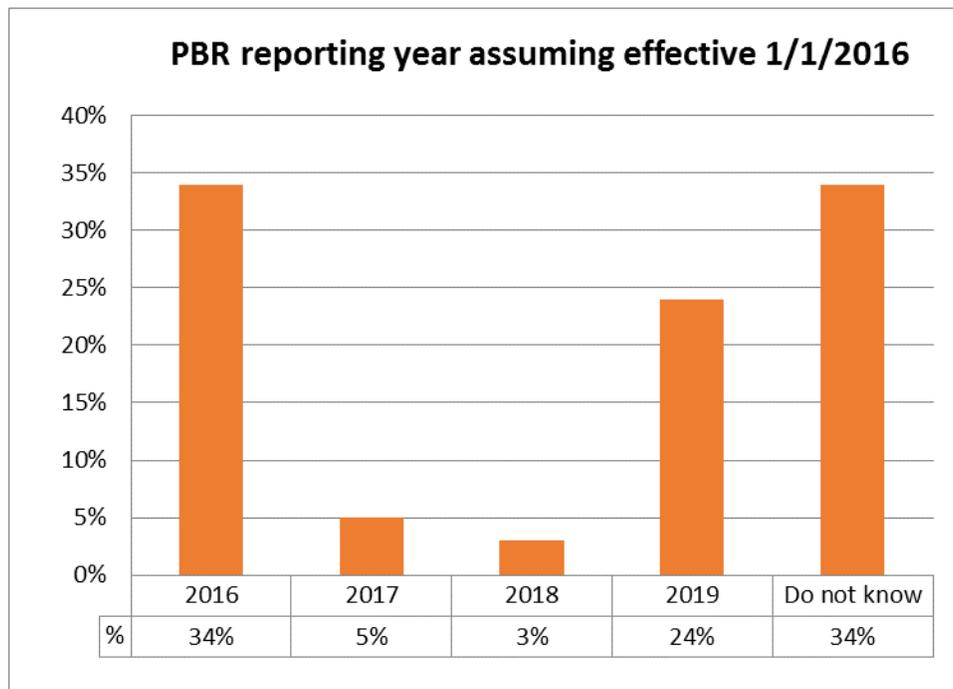
The following results by product exclude those who responded “Do not offer this product”:

- Term: Term respondents were fairly evenly split in their responses. Twelve of the 37 expected their company would pass both exclusion tests, while 15 expected their company would not. The remaining ten who offered term products did not know if their company would pass the exclusion tests.
- Whole Life: For the 35 respondents whose companies offered whole life products, nearly half (16 of 35) believed their company would pass both exclusion tests. Seven

expected their company would not pass the exclusion tests and the remaining 12 respondents did not know.

- **UL with Secondary Guarantee:** For respondents whose companies offered UL with secondary guarantee, the majority (19 of 26) expected their company would not pass the exclusion tests. The remaining seven who offer UL with secondary guarantee did not know if their company would pass the exclusion tests.
- **Other UL:** Similar to the term results, the “Other UL” product responses were fairly evenly split. Eight of the 29 expected their company would pass both exclusion tests and eight expected their company would not. The remaining 13 who offered “Other UL” products did not know if their company would pass the deterministic and stochastic exclusion tests.

11. As proposed, PBR will have a three-year transition period. The Survey asked respondents when their company would begin reporting PBR in their annual statement if PBR became effective 1/1/2016. There were 38 respondents to this question.



While 34% of the respondents did not know when they would be reporting PBR in their company’s annual statement, those that did know appeared to be either early or late adopters. Excluding the “Do not know” responses, 13 of 25 expected to report the first year PBR becomes effective, while nine of the 25 respondents anticipated reporting PBR at the end of the three-year transition period. The majority of those who expected to report in the first year PBR becomes effective also responded they were very familiar with the proposed changes to the Standard Valuation Law and the Valuation Manual (Question 1). Also, the majority of those who expected to report in the first year PBR becomes effective were either term and/or ULSG writers (11 of 13 wrote term business and 6 of 13 wrote UL with Secondary Guarantee).

12. The Standard Valuation Law and Valuation Manual will place increased responsibility on the board, senior management and qualified actuaries with respect to the determination of PBR reserves. The Survey asked respondents when their company would inform their board of their increased responsibilities under PBR. Thirty-eight companies responded to the question.

<b>When will Board be Informed of Increased Responsibilities under PBR?</b>	<b># of Respondents</b>
Discussions Already Started	5 (13%)
Next 12-24 Months	21 (55%)
Waiting until Effective Date	8 (21%)
Do Not Know	4 (11%)
<b>Total # of Respondents</b>	<b>38</b>

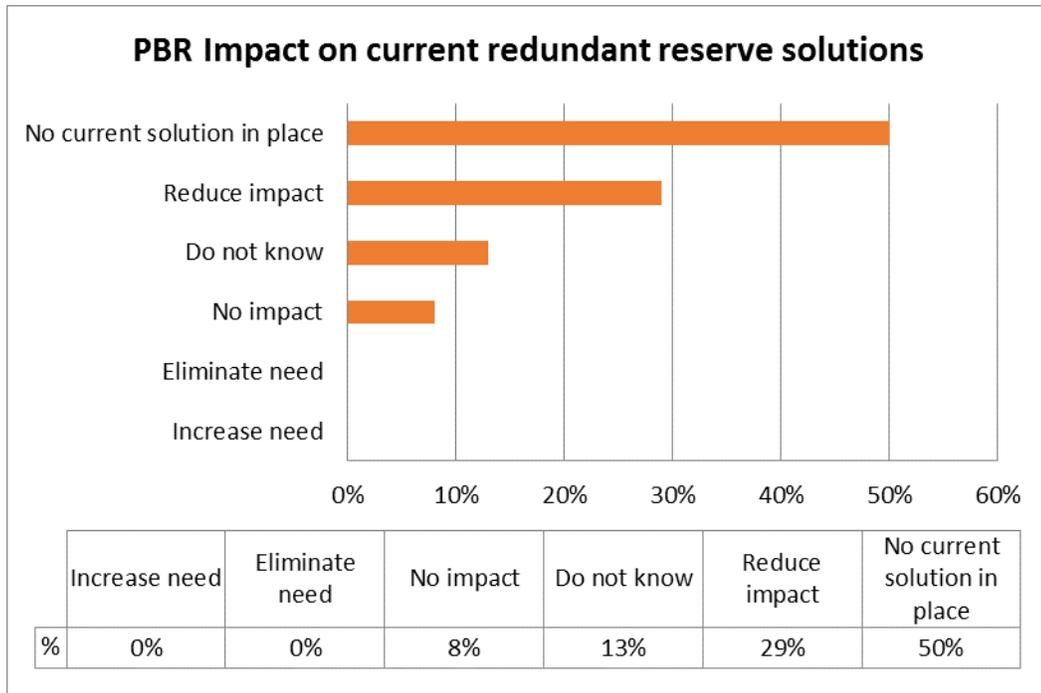
Just 13% (5 of 38) of the respondents had already started discussions with their board regarding increased responsibilities under PBR, but 55% (21 of 38) expected to begin discussions in the next 12-24 months. An additional 21% (8 of 38) of the respondents were waiting until the effective date to inform their board of the increased responsibilities.

13. The Survey asked respondents when their company would inform senior management of their increased responsibilities under PBR. Thirty-eight survey respondents answered this question.

<b>When will Senior Management be Informed of Increased Responsibilities under PBR?</b>	<b># of Respondents</b>
Discussions Already Started	13 (34%)
Next 12-24 Months	16 (42%)
Waiting until Effective Date	5 (13%)
Do Not Know	4 (11%)
<b>Total # of Respondents</b>	<b>38</b>

Discussions with senior management about their increased responsibilities under PBR had already started with 34% of the respondents. An additional 42% expected to begin discussions with senior management in the next 12-24 months. Only 11% did not know when senior management would be informed of their increased responsibilities.

14. For companies with a current redundant reserve solution in place, the Survey asked respondents how they thought PBR would impact the need for this solution for future new business issued after the effective date of PBR. There were 38 respondents to this question.

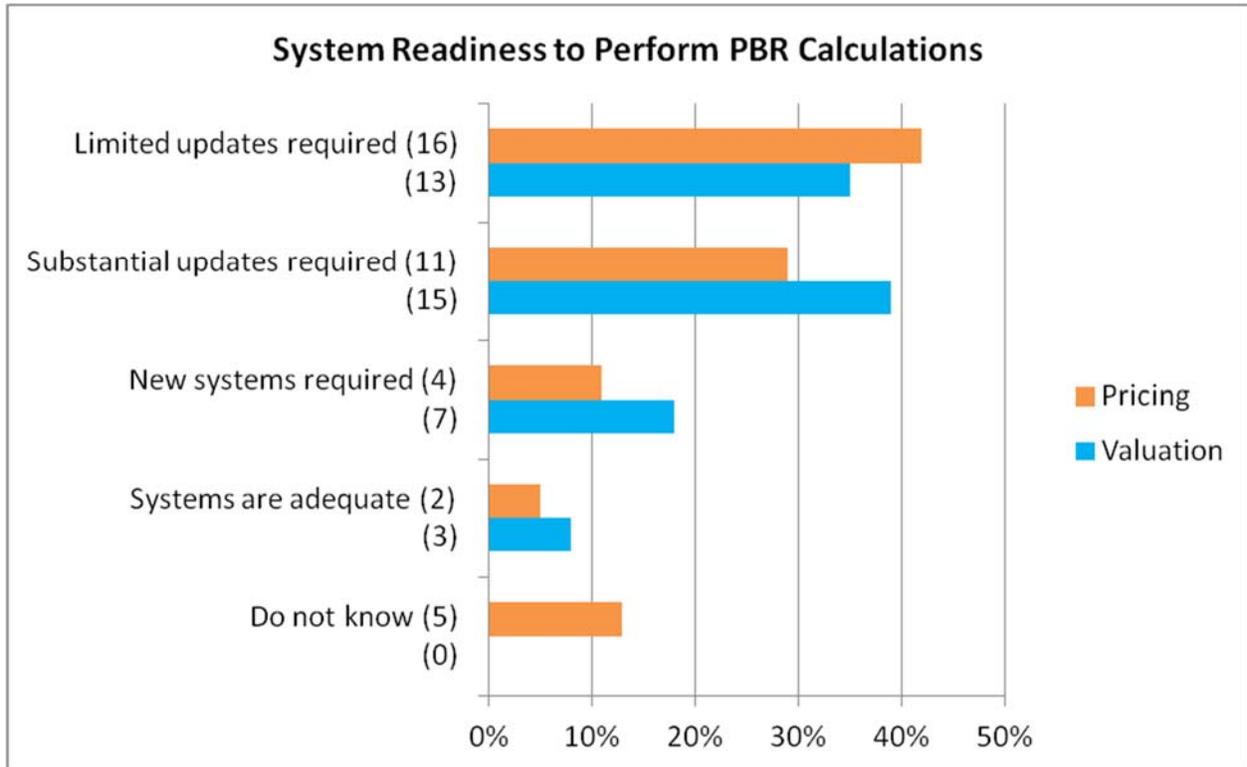


Nineteen respondents had no current solution in place for redundant reserves. Sixteen of the 19 respondents with no current solution in place also reported their company had level term business in force and 11 of 19 respondents reported their company had ULSG business in force. Of the remaining 19 respondents who did have a solution in place, the majority (11 respondents) believed PBR would reduce the need for such a solution for future new business. No one felt PBR would increase the need for a redundant reserve solution.

## Section 2 - Resources

The purpose of this section was to obtain information regarding the resources, systems and staff, required to implement PBR.

15. The Survey asked respondents which best matched the adequacy of their company's current pricing and valuation systems for performing PBR calculations. In total, 38 companies responded to this question. The responses are summarized below (**the number in parentheses indicates the number of respondents who anticipated making changes**):



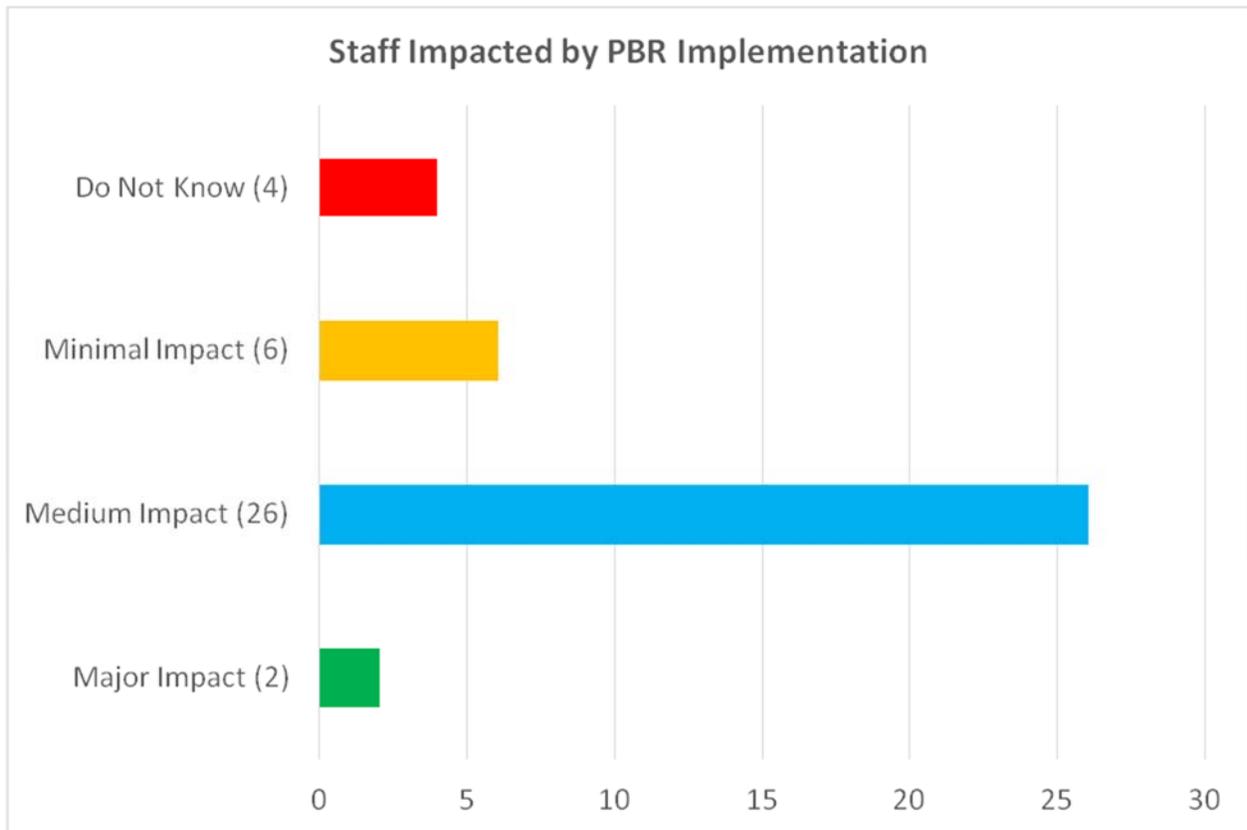
Less than 10% of the respondents felt their current pricing and valuation systems were adequate for performing PBR calculations. The majority of respondents felt that updates to existing systems or new systems would be required to meet the new requirements. Twenty-nine percent of the respondents indicated substantial updates/enhancements would be needed for pricing, while 39% said substantial updates/enhancements would be needed for valuation. Limited updates were indicated as needed for pricing by 42% and for valuation by 34% of the respondents.

16. The Survey asked respondents how their company intended to perform PBR calculations and were asked to check all that apply. There were 38 respondents to this question.

<b>PBR Calculation Method</b>	<b>Total # of Responses</b>
Purchase Software	28 (74%)
Internal Software	15 (39%)
Do Not Know	2 (5%)
Other	1 (3%)
Contract with Consulting Firm	1 (3%)
<b>Total # of Respondents</b>	<b>38</b>

Seventy-four percent of the respondents answered they would purchase software to perform PBR calculations. Of the 15 respondents who plan to use internal software to perform PBR calculations, 10 intend to do so for both their pricing and valuation system, regardless of the amount of updates required.

17. The Survey asked respondents to what degree their company's staffing would be impacted by PBR implementation. Thirty-eight companies responded to this question. The responses are summarized below (**the number in parentheses indicates the number of respondents who anticipated making changes**):



Almost all respondents indicated staffing would be impacted by PBR implementation. Five percent reported a major impact: the need to hire or contract with subject matter experts; 68% reported a medium impact: the need to make some changes to staff; and 16% reported minimal impact: the current staff would be able to handle the additional work with PBR implementation.

18. If they did anticipate an impact to staffing, the Survey asked respondents to indicate their company's plans to manage the need for additional actuarial resources for each department to handle PBR implementation. The total number of respondents varied as indicated in the table below.

<b>Additional Actuarial Resources Plan by Department</b>	<b>Valuation</b>	<b>Pricing</b>	<b>Asset Liability</b>	<b>Experience Reporting</b>	<b>Other</b>
Hire Additional Actuarial Resources	17 (45%)	5 (13%)	4 (11%)	10 (26%)	1 (3%)
Rely on Consulting Actuaries	9 (24%)	6 (16%)	7 (18%)	6 (16%)	1 (3%)
Do Not Know	7 (18%)	11 (29%)	11 (29%)	8 (21%)	2 (5%)
Reallocate Internal Actuarial Resources	5 (13%)	10 (26%)	9 (24%)	10 (26%)	0 (0%)
Rely on Assistance from Reinsurers	0 (0%)	0 (0%)	0 (0%)	1 (3%)	0 (0%)
<b>Total # of Respondents</b>	<b>38</b>	<b>32</b>	<b>31</b>	<b>35</b>	<b>4</b>

Respondents who selected “other” provided ‘Modeling’ and ‘Peer Review’ as the areas that would require additional actuarial resources.

Respondents indicated they would address the need for additional resources in different ways, depending on the function. For valuation, respondents indicated they were more likely to either hire additional actuarial resources (45%) or rely on consulting actuaries (24%) to handle PBR implementation rather than rely on internal resources. For pricing and asset liability management, respondents either did not yet know (29%) or indicated they would reallocate internal actuarial resources (26%) to these departments. For experience reporting, respondents would either hire additional actuarial resources (26%) or reallocate internal actuarial resources (26%).

19. The Survey asked respondents whether their company had developed training plans for employees in preparation for implementing PBR. There were 37 respondents for Actuarial Staff and 36 for Non-Actuarial Staff.

<b>Plan Established</b>	<b>Actuarial Staff</b>	<b>Non-Actuarial Staff</b>
No	31 (84%)	36 (100%)
Yes	6 (16%)	0 (0%)
<b>Total # of Respondents</b>	<b>37</b>	<b>36</b>

One respondent chose to not answer this question and another only filled out the Plan for Actuarial Staff. While all respondents indicated they have not yet developed training plans for their non-actuarial staff, 16% have developed plans for their actuarial staff.

20. The Survey asked respondents what their company's anticipated costs would be to implement PBR. Thirty-eight companies responded to this question.

<b>Anticipated Costs</b>	<b># of Respondents</b>
\$0 - 9,999	0 (0%)
\$10,000 - 50,000	5 (13%)
\$50,001 - 100,000	2 (5%)
\$100,001 - 250,000	1 (3%)
\$250,001 - 500,000	6 (16%)
\$500,001 - 1,000,000	0 (0%)
\$1,000,001 - 5,000,000	3 (8%)
\$5,000,001 - 10,000,000	0 (0%)
>\$10,000,000	1 (3%)
Do Not Know	20 (53%)
<b>Total # of Respondents</b>	<b>38</b>

Approximately half (53%) of the respondents did not know the anticipated costs to implement PBR. For those who did, one-third expected to spend between \$250,001 and \$500,000, while 13% expected to spend between \$10,000 and \$50,000. This compares to 11% who expect to spend in excess of \$1 million.

21. The Survey asked respondents what their company's anticipated annual costs would be once PBR was implemented. Thirty-eight companies responded to this question.

<b>Anticipated Annual Costs</b>	<b># of Respondents</b>
\$10,000 - 25,000	6 (16%)
\$25,001 - 50,000	0 (0%)
\$50,001 - 100,000	1 (3%)
\$100,001 - 250,000	4 (11%)
\$250,001 - 500,000	3 (8%)
\$500,001 - 1,000,000	2 (5%)
>\$1,000,000	0 (0%)
Do Not Know	22 (58%)
<b>Total # of Respondents</b>	<b>38</b>

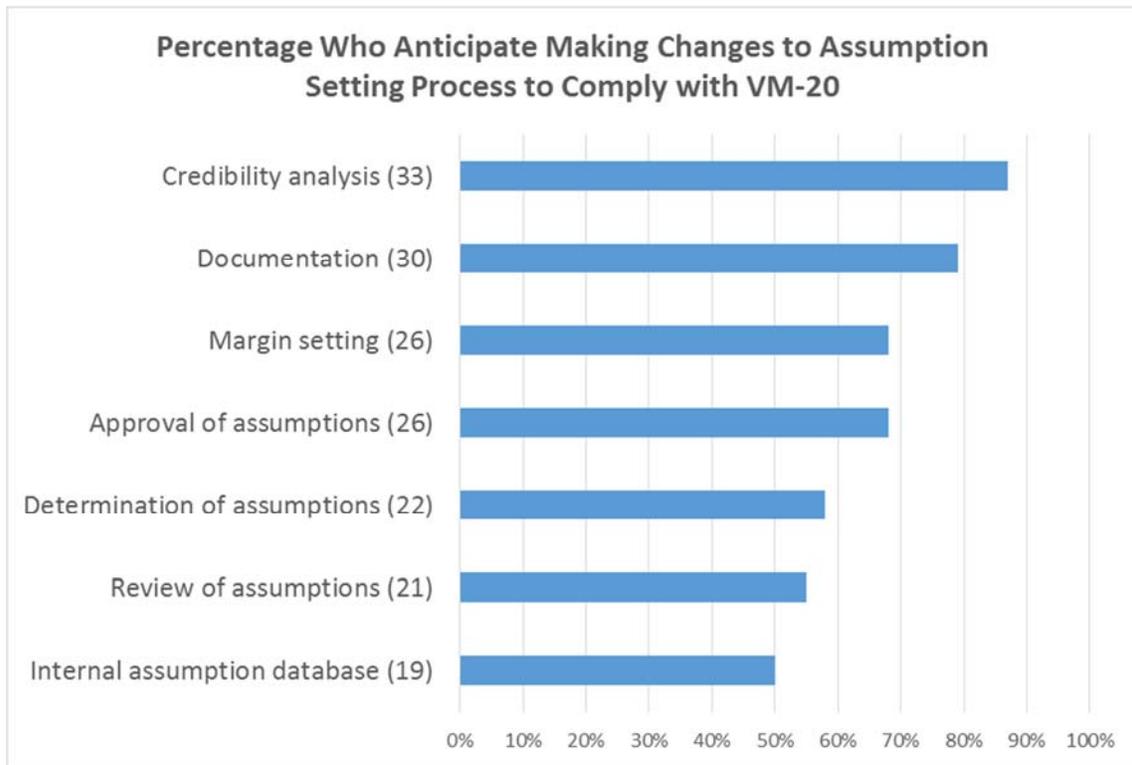
Approximately half (58%) of the respondents did not know the anticipated annual costs following PBR implementation. For those who did, 38% expected to spend between \$10,000 and \$25,000 annually, while 25% expected to spend between \$100,001 and \$250,000 annually.

Comparing the results of questions 21 and 22, it was noted that 80% of the respondents were planning to spend about half of their implementation costs annually thereafter on PBR.

### Section 3 – Mortality Assumption Setting and Modeling

The purpose of this section was to elicit information regarding the respondents’ understanding of PBR requirements related to experience studies, mortality assumptions and modeling and their plans for meeting these requirements.

- 22. The Survey asked if companies currently had a formal approval process (i.e., documentation of development, meeting minutes, and clearly identified individuals with approval authority) for the specified activities related to valuation. Thirty-one of 38 respondents (82%) indicated they currently had a formal approval process for the assumptions and 25 of 38 (66%) indicated they had a formal approval process for their models.
- 23. The Survey asked respondents if they anticipated making changes to different areas in their assumption setting process to comply with VM-20. In total, 38 companies responded to this question. The responses are summarized below (**the number in parentheses indicates the number of respondents who anticipated making changes**):



At least 50% of respondents indicated they expected to make changes in each of the areas of their assumption setting process. Credibility analysis and documentation were the two areas where more than three-quarters of respondents indicated they anticipated making changes in order to comply with VM-20.

24. When determining appropriate mortality assumptions to be used in determining reserves, PBR requires life insurance companies to use company mortality experience to the extent that it is credible. In addition, companies must re-evaluate mortality assumptions for each segment at least every three years. The Survey asked several questions on the topic of mortality studies to determine the respondents' preparedness in meeting the requirements of PBR.

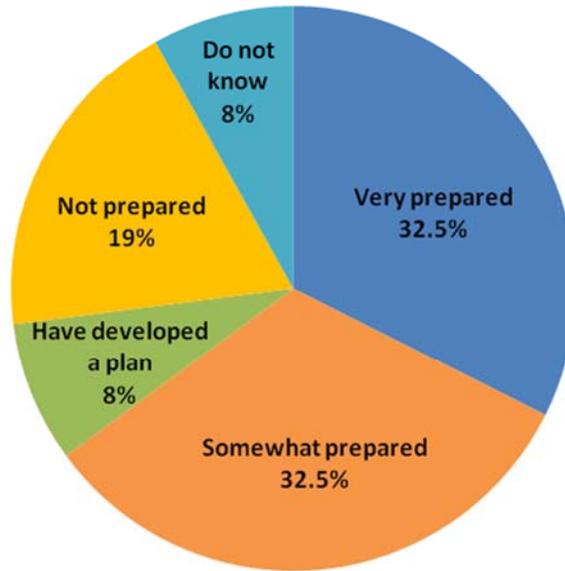
- a. First, the Survey asked respondents to indicate their current frequency of completing mortality studies. Thirty-eight companies responded to this question.

<b>Frequency</b>	<b># of Respondents</b>
More Frequently than Annually	5 (13%)
At least Every Year but Less than 2 Years	28 (74%)
At least Every 2 Years but Less than 3 Years	2 (5%)
Every 3 Years	0 (0%)
Longer than Every 3 Years	3 (8%)
Other	0 (0%)
<b>Total # of Respondents</b>	<b>38</b>

Over 85% indicated they completed mortality studies at least every year (but less than 2 years) or more frequently.

- b. The Survey asked if the company has dedicated staff and system resources to perform experience studies. Twenty-eight of 38 respondents (74%) indicated they had dedicated staff to perform experience studies. Twenty of 38 respondents (53%) indicated they had dedicated system resources to perform experience studies.
- c. The Survey also asked each respondent to indicate how prepared their company was to perform mortality studies to the extent required by PBR. Thirty-seven companies responded to this question.

## Level of Preparedness to Perform Mortality Studies to the Extent Required by PBR



Twelve of the respondents indicated their companies were very prepared and were currently able to perform these studies to the extent required by PBR. Of those that responded “Very prepared,” 10 of the 12 wrote both term and UL with secondary guarantees. Of those that responded “Somewhat prepared,” 7 of the 12 wrote both term and UL with secondary guarantees.

25. The Survey asked respondents to indicate whether their companies anticipated they would have fully credible experience, would use an industry experience table or anticipated having partially credible experience blending into an industry table for setting a number of assumptions. Thirty-eight companies responded to this question.

Assumption	Own Credible Experience	Industry Experience Table	Blending at Some Ages and Durations	Do Not Know	Total # of Respondents
Company Expense	24 (64%)	0 (0%)	7 (18%)	7 (18%)	<b>38</b>
Premium Patterns	19 (50%)	0 (0%)	11 (29%)	8 (21%)	<b>38</b>
Surrender	10 (26%)	0 (0%)	22 (58%)	6 (16%)	<b>38</b>
Mortality	8 (21%)	3 (8%)	24 (63%)	3 (8%)	<b>38</b>
Policy Loans	7 (18%)	1 (3%)	12 (32%)	18 (47%)	<b>38</b>

The majority of respondents planned to use their own credible experience when setting expense assumptions. For premium payment patterns, 50% of the respondents planned to use their own company experience, and an additional 29% anticipated blending with industry

experience at some ages and durations. More than half of the respondents (24 of 38) indicated they would blend with industry tables for surrender and mortality assumptions with a much smaller percentage indicating they would use their own credible experience.

26. VM-30 and VM-31 require life insurance companies to report specific information in the PBR Actuarial Report regarding mortality assumptions used in determining reserves. (VM-31 Section 3 E 4).

- a. The Survey asked respondents if their company was familiar with the reporting requirements in VM-30 and VM-31. Twenty-six respondents (68%) indicated their company was familiar with the VM-30 and VM-31 reporting requirements. The remaining 32% indicated their company was not familiar with the requirements.
- b. The Survey then asked respondents to indicate their level of preparedness to meet the reporting requirements in VM-30 and VM-31. Thirty-eight companies responded to this question.

<b>Level of Preparedness</b>	<b># of Respondents</b>	<b>% of Respondents</b>
Very Prepared (able to report currently)	0	0%
Somewhat Prepared (have a plan in place and in process of implementing)	5	13%
Have Developed a Plan	2	5%
Not Prepared	21	56%
Do Not Know	10	26%
<b>Total # of Respondents</b>	<b>38</b>	<b>100%</b>

No respondents indicated they were very prepared to meet the reporting requirements. More than half (21 respondents) indicated they were not prepared. A small number indicated they were somewhat prepared or had developed a plan to meet the reporting requirements.

27. PBR requires life insurance companies with more than \$50 million in individual life premiums to submit mortality data annually. The requirements for these submissions are described in VM-50 Section 2. The specific data format is described in VM-51 and reflects what is currently requested in voluntary SOA data submissions.

- a. The Survey asked if respondents were familiar with the requirements of VM-50 and VM-51. Thirty-three of 38 respondents (87%) indicated their companies were familiar with the requirements.
- b. Next, the Survey asked respondents if their company already submitted mortality data to the New York or Kansas statistical agent for its mandatory study. Twenty-one of the respondents (55%) indicated their company submitted mortality data to a statistical agent for a mandatory study.
- c. The Survey also requested information on company participation in SOA data requests. Just over half of the respondents (20 of 38) indicated their company submitted mortality data to SOA data requests. Sixteen of these 20 respondents

indicated they submitted data to the New York or Kansas statistical agent for its mandatory study.

- d. The next Survey question asked respondents to indicate their level of preparedness to meet the requirements in VM-50. There were 38 respondents to this question.

<b>Level of Preparedness</b>	<b># of Respondents</b>
Very Prepared (able to report currently)	16 (42%)
Somewhat Prepared (have a plan in place and in process of implementing)	2 (6%)
Have Developed a Plan	1 (3%)
Not Prepared	7 (18%)
Do Not Know	5 (13%)
Not Applicable	7 (18%)
<b>Total # of Respondents</b>	<b>38</b>

Sixteen of the respondents (42%) indicated their company was very prepared and able to report currently. Seven respondents indicated their company was not prepared to meet the requirements and another seven indicated they did not expect to be required to submit mortality data annually.

28. When setting the mortality assumption, the procedure involves using credibility-weighted company experience graded to industry basic tables. The process will involve determining appropriate mortality segments, using an Underwriting Criteria Score or other actuarially sound method to determine the appropriate industry table, applying prescribed margins and blending company experience to industry tables based on credibility levels. Mortality improvement may be included up to the valuation date, but not beyond the valuation date. The Survey asked respondents if their company had determined the following pieces of the mortality assumption to be used in a VM-20 reserve calculation (for any products).

<b>Mortality Assumption Development</b>	<b>Yes</b>	<b>No</b>	<b>Total # of Respondents</b>
Appropriate Industry Table	19 (50%)	19 (50%)	<b>38</b>
Mortality Segments	17 (45%)	21 (55%)	<b>38</b>
Credibility Level	16 (42%)	22 (58%)	<b>38</b>
Assumption to be Used	15 (39%)	23 (61%)	<b>38</b>
Underwriting Criteria Score (if applicable)	13 (34%)	25 (66%)	<b>38</b>
Other Actuarially Sound Method to Subdivide Mortality Segments (if applicable)	4 (12%)	28 (88%)	<b>32</b>

More than 50% of the respondents to this question indicated their companies had not determined any of the pieces needed to calculate the VM-20 mortality assumption. Of those companies who had determined some of the required mortality assumption pieces, at least 42% had chosen the appropriate industry table, the mortality segments and the credibility level. Thirty-nine percent of the respondents indicated their company had already calculated the mortality assumption to be used.

For the 15 who responded “Yes” to “Assumption to be used” for setting the VM-20 mortality assumption, approximately half of the companies had material (greater than \$10 million) annualized premium for both ULSG and Term products, averaging \$1.4 billion and \$506 million, respectively.

29. The Survey asked respondents whether their company intended to use mortality improvement from the date of the study to the valuation date. Thirty-eight companies responded to this question.

<b>Plan to Use Mortality Improvement</b>	<b># of Respondents</b>
Do Not Know	20 (53%)
Yes	15 (39%)
No	3 (8%)
<b>Total # of Respondents</b>	<b>38</b>

More than half (53%) of the Survey respondents indicated their companies had not made a decision on whether or not to include mortality improvement between the study date and the valuation date. Of those who had made this decision, 83% indicated they would include mortality improvement between those two dates.

30. The Survey asked respondents how robust their company’s modeling documentation was. (For background information on this topic, please see the Society of Actuaries’ research study: [A Survey of Actuarial Modeling Controls in the Context of a Model-Based Valuation Framework](#)). Thirty-eight respondents answered this question.

<b>Robustness of Modeling Documentation</b>	<b># of Respondents</b>
Not Robust, but Adequate	19 (50%)
Needs Improvement	15 (39%)
Very Robust	4 (11%)
Do Not Know	0 (0%)
<b>Total # of Respondents</b>	<b>38</b>

Half of the respondents reported that their company’s modeling documentation was adequate. The majority of the remaining respondents (39%) indicated their modeling documentation needed improvement.

31. The Survey asked respondents if their company anticipated using model compression techniques in stochastic modeling to reduce run time or if they would run models on a seriatim basis. Thirty-eight companies responded to this question.

<b>Stochastic Modeling</b>	<b># of Respondents</b>
Seriatim	14 (37%)
Use Model Compression Techniques	12 (32%)
Do Not Know	12 (2%)
<b>Total # of Respondents</b>	<b>38</b>

Approximately one-third were undecided on whether they would use model compression techniques. Of those who had decided (69%), slightly more than half indicated they would run their models on a seriatim basis. Half of those respondents who plan to run their models on a seriatim basis have annualized premiums of at least \$100 million.

32. The Survey asked respondents what steps their company would take to make sure their internal models were auditable. This question received 37 responses.

<b>Model Auditability</b>	<b># of Respondents</b>
Have Sarbanes-Oxley (SOX) Guidelines in Place that Will Address Model Auditability	16 (43%)
Do Not Know	13 (35%)
Will Follow Use Tests, Statistical Tests, Calibration Tests and Additional Requirements for the Use of Internal Models	6 (16%)
Other	2 (5%)
<b>Total # of Respondents</b>	<b>37</b>

Other Methods to Ensure Model Auditability:

- *MAR and model governance*
- *Will rely on documentation, static and dynamic validations, etc.*

Forty-three percent of the respondents reported their company's current SOX guidelines would address model auditability. Most of the remaining companies (35%) had not decided how to ensure their models were auditable.

## Section 4 – Product Development Implications

The purpose of this section was to determine the potential impact of PBR for product development actuaries.

33. The Survey asked respondents whether they expected to redesign products or shift product mix as a result of PBR. This question received 37 responses.

<b>Product Redesign or Product Shift</b>	<b># of Respondents</b>
Yes	14 (38%)
No	12 (32%)
Do Not Know	11 (30%)
<b>Total # of Respondents</b>	<b>37</b>

The responses indicated a fair amount of uncertainty about the impact of PBR on product offerings, with nearly one-third of the respondents indicating they did not know the impact.

34. Respondents were asked when they would notify marketing and / or sales division(s) that product pricing or design might be affected by PBR. Thirty-six companies responded to this question.

<b>Marketing Discussion</b>	<b># of Respondents</b>
Have Already Started Discussions	6 (17%)
Planning to in the Next 12-24 Months	14 (39%)
Waiting until the Effective Date	11 (30%)
Other	3 (8%)
Do Not Know	2 (6%)
<b>Total # of Respondents</b>	<b>36</b>

Of the six respondents who had already started discussions, three indicated “Yes” to question 33 and two others were unsure of potential changes in design and product mix. One respondent who already had discussions with the Marketing Division about product design and mix did not believe PBR would have an impact on product design or mix.

Viewed from the perspective of question 33, a belief that product design or mix might change under PBR did not correlate to a greater sense of urgency in initiating discussions regarding potential changes. Of the 14 respondents who believed changes would occur in product design or mix, only three had started discussions with Marketing.

Respondents who selected “Other” offered the following on when they intended to notify their marketing or sales division(s) regarding changes in product design:

- *No changes to pricing or design expected*
- *Once it appears that PBR is likely, i.e. NY and CA are on board*
- *Sometime during the phase-in period*

35. The Survey asked when product actuaries would play an active role in discussions with others in the company (i.e., valuation, management, marketing or sales) regarding the impact of PBR on the development of new products. Thirty-seven respondents answered this question.

<b>Actuarial Discussion</b>	<b># of Respondents</b>
Have Already Started Discussions	13 (35%)
Planning to in the Next 12-24 Months	17 (46%)
Waiting until the Effective Date	3 (8%)
Other	3 (8%)
Do Not Know	1 (3%)
<b>Total # of Respondents</b>	<b>37</b>

The higher totals reported for the first two categories (relative to question 34) suggest discussions on the impact of PBR on pricing initially involve valuation actuaries and management and later expand to include marketing and other company divisions.

These totals indicate that, within the next two years, most companies will be active in PBR-based product discussions.

Respondents who selected “other” offered the following on when they planned to have their product actuaries play an active role in discussions within the company:

- *Sometime during the phase-in period*
- *When product development activities begin*

36. The Survey asked when respondents planned to have an established process in place to coordinate efforts between valuation and product actuaries for setting mortality assumptions to determine appropriate reserve levels for new products. Thirty-seven companies responded to this question.

<b>Actuarial Coordination</b>	<b># of Respondents</b>
Have Already Started Discussions	15 (41%)
Planning to in the Next 12-24 Months	14 (38%)
Waiting until the Effective Date	5 (13%)
Other	2 (5%)
Do Not Know	1 (3%)
<b>Total # of Respondents</b>	<b>37</b>

Respondents who selected “other” offered the following on when they planned to have an established process of coordination between the valuation and product development departments:

- *Sometime during the phase-in period*
- *When product development activities begin*

37. Respondents were asked what type of models they currently relied on for product pricing. There were 38 responses to this question.

<b>Product Pricing Method</b>	<b># of Respondents</b>
Deterministic Models (expected or mean results)	24 (63%)
Stochastic Models Showing Tail Risk and Confidence Levels	0 (0%)
Both Deterministic and Stochastic Models are Used to Set Final Pricing	14 (37%)
<b>Total # of Respondents</b>	<b>38</b>

Two respondents indicated stochastic modeling varied by product. In most instances, it was used by companies to evaluate product sensitivity, particularly where higher interest rate risk existed. These companies are included in the 14 respondents using both deterministic and stochastic modeling processes.

38. Assuming stochastic models were used for pricing in a PBR environment, respondents were asked which assumptions might be stochastically tested for the purposes of setting reserves. Twenty-nine companies responded to this question.

<b>Stochastic Modeling of...</b>	<b>Yes</b>	<b>No</b>	<b>Do Not Know</b>	<b>Total # of Respondents</b>
Mortality	1 (3%)	11 (38%)	17 (59%)	<b>29</b>
Persistency	4 (14%)	9 (31%)	16 (55%)	<b>29</b>
Investment Return	19 (66%)	1 (3%)	9 (31%)	<b>29</b>
Expenses	0 (0%)	13 (45%)	16 (55%)	<b>29</b>
Other	1 (3%)	0 (0%)	0 (0%)	<b>1</b>

Answers to this question imply that 29 respondents used or would consider use of stochastic modeling for various variables despite the fact that question 37 indicated only 14 respondents actively use stochastic models for pricing today. None of the 29 respondents answered “No” for all four of the listed variables (meaning each of the 29 either used or might use stochastic modeling for one or more variables).

By far, the most prominent variable to be evaluated under stochastic models was investment return. However, under a PBR environment, a majority of the 29 respondents either used or were uncertain (would consider) about using stochastic modeling for mortality, persistency and expenses.

One respondent identified “equity returns” as an additional use of stochastic modeling under the “Other” category. This respondent was also included in the 29 who provided answers for the listed variables.

39. The Survey asked respondents if their current documentation for pricing methodology, assumptions and results was believed to be sufficient under PBR for the following audiences. There were 37 respondents to this question.

<b>Audiences</b>	<b>Yes</b>	<b>No</b>	<b>Do Not Know</b>	<b>Total # of Respondents</b>
Inter-Office Communications to Financial or Valuation Actuaries	20 (54%)	7 (19%)	10 (27%)	<b>37</b>
Senior Management Review	13 (35%)	11 (30%)	13 (35%)	<b>37</b>
Board of Directors Review	2 (5%)	15 (41%)	20 (54%)	<b>37</b>

The level of “Do Not Know” responses indicates a slightly higher level of uncertainty than perhaps seen in earlier questions of the survey (questions 1 – 6). This suggests that, while many actuaries are aware of certain aspects of PBR, a review of reporting standards under a PBR regimen remains to be examined.

Overall, there was a higher level of satisfaction with internal reporting between actuaries (pricing and valuation). The level of satisfaction eroded as the audience became more senior in level, with only 5% of respondents feeling reporting to the Board of Directors was at a sufficient level.

40. The Survey asked respondents to identify additional topics they would like to see covered in a follow-up PBR survey.

Four respondents gave suggestions for topics they would like to see covered in a follow-up survey:

- *Application of Stochastic and Deterministic Exclusion Tests / Reinsurance / Asset Modeling / Scenario Generation*
- *Examples and applications of Stochastic and Deterministic Exclusion Tests / Reinsurance*
- *More info specific to smaller companies and the impact on them.*
- *We would like to see a separate series of survey questions for reinsurers.*

41. The Survey allowed for additional comments or questions that respondents had regarding the survey.

The four respondents to this provided the following additional comments regarding the survey:

- *Our company has minimal life insurance sales in recent years. The current rate is about 1,000 nonpar WL and 250 Index UL policies per year. We plan to introduce a new term product in 2014. Most new business has simplified underwriting. If the new term product is moderately successful, PBR planning for the product will be important. Implementation of PBR for the term product would occur as quickly as feasible, after PBR becomes effective. The timetable regarding PBR implementation for nonpar whole life, and Index UL is less clear, and further analysis is needed.*
- *Some questions could have used additional options for responses - i.e. #8, there is no option for "current reserves are appropriate", or "current reserves will not change due to PBR". #14 implies companies should have a redundant reserve "solution" in place, rather than asking the question. And lastly, question #10 needs rewording - if you pass the stochastic and deterministic exclusion tests, you are not "exempt" from PBR, you just end up in a different place - i.e. the net premium reserve.*
- *The summary of in-force business is interesting, but PBR only covers new business. For most older companies, one would not expect these to necessarily be telling the same tale.*
- *We are a small company with limited resources. I have been heavily involved with the LRWG in the past but over the last couple of years have been more in the background. It seems that there are a number of outstanding issues and I am not convinced that PBR will get the necessary state approvals. I am paying attention to the activity but believe that I will have sufficient time to address PBR once it appears to be more likely to be effective.*

## Appendix A – List of Contributing Companies

American Family Life  
American National Ins. Co.  
Ameritas Life Insurance Corp.  
Athene Annuity and Life Assurance Company of NY  
Bankers Life and Casualty Company  
Catholic Financial Life  
Colonial Security Life Insurance Company  
Connecticut General Life Insurance Company  
Conseco Life Insurance Company  
Conseco Life Insurance Company of Texas  
Dearborn National  
FBL Financial Group  
Florida Combined\*  
Gen Re Life Corporation  
Government Personnel Mutual Life Insurance Company  
Grand Lodge of the Order of the Sons of Hermann in the State of Texas  
Hannover Life Reassurance Company of America  
Humana  
Kansas City Life Insurance Company  
Knights of Columbus  
Legal & General America  
Liberty Life Assurance Company of Boston  
Life of Alabama\*  
Lincoln Financial Group  
MassMutual Life  
MetLife Investors USA  
Metropolitan Life Insurance Company  
Midland National Life Insurance Company  
N.T.A. L.I.C.  
National Guardian Life Insurance Company  
National Security Life\*  
New York Life Insurance Company  
North American Company for Life and Health Insurance  
Northwestern Mutual  
Oxford Life Insurance Co  
Pacific Life  
Penn Mutual Life Insurance Company  
Phoenix Life Insurance Company  
Protective Life and Annuity Insurance Company  
Protective Life Insurance Company  
Pruco Life Insurance Company  
Sagicor Life Insurance Company  
Settlers Life Insurance Company  
SWBC Life Insurance Company

The Baltimore Life Companies  
UCT Insurance Company\*  
Unified Life Insurance Company  
Universal American Corp  
USAA  
USAb\*  
Vantis Life Insurance Company  
VOYA (Formerly ING U.S.)  
Western and Southern

\*Filed by consultant

## Appendix B – Mortality and Other Implications of PBR Survey

### Introduction

In anticipation of the adoption of the revised Standard Valuation Law by the number of states necessary to adopt the Valuation Manual, companies are currently preparing to implement principle-based reserves (PBR). This Survey, which is being conducted jointly by the Society of Actuaries' Committee on Life Insurance Mortality and Underwriting Surveys and the National Association of Insurance Commissioners (NAIC) Principle-Based Reserving Implementation (EX) Task Force, is designed to provide an overview of the current state of the industry's preparedness for implementing PBR. This initial Survey is designed to cover general issues related to implementing PBR. Future surveys are planned which will cover many of these issues in greater detail.

This Survey seeks to elicit information primarily from U.S. chief actuaries, with input from other areas as appropriate. This Survey is intended to determine the preparedness of each company. Thus, if "you" or "your" is used, it is intended to mean the company and not the individual answering the survey.

The survey contains the following four (4) sections:

1. Overview: This section focuses on general topics related to PBR.
2. Resources: This section focuses on the required resources and anticipated costs of implementing PBR.
3. Mortality Assumption Setting and Modeling: This section focuses on the PBR requirements related to setting mortality assumptions and completing mortality experience studies.
4. Product Development Implications: This section covers the impact of PBR to the product development process.

Do you believe your company will be exempt from PBR?

- Yes
- No

Why do you believe your company will be exempt?

### Demographic Information

Please provide the following information for each product based on your company's in force at 12/31/2013. If your company does not issue the product, please respond with "N/A." Please specify these amounts, including riders and gross of reinsurance.

	Annualized Premium	Policy Count	Face Amount
10-Year Term			
15-Year Term			
20-Year Term			
30-Year Term			
> 30-Year Term			
Other Term (please specify)			
UL with Secondary Guarantee (including indexed)*			
Other UL (please specify)			
Whole Life			
Variable Life			
Other Life Products (please specify)			

\* Note: Throughout the survey, UL with Secondary Guarantee refers to a product with a guarantee longer than 5 years.

## Section 1 - Overview

1. How familiar is your company with the proposed changes to the Standard Valuation Law and the Valuation Manual?

- Very familiar
- Aware of changes
- No knowledge

2. How familiar is your company with the Society of Actuaries' PBA Implementation Guide (<http://www.soa.org/Research/Research-Projects/Life-Insurance/research-2013-pba-implementation-guide.aspx>)?

- Very familiar (Have read the executive summary, one or more case studies and the road maps)
- Aware (Limited review of the guide)
- No knowledge

3. If you answered "Very familiar" in question 2, which of the six (6) case studies is / are most similar to the PBR implementation process that you expect for your company? (Please check all that apply)

- 1
- 2
- 3
- 4
- 5
- 6
- Do not know

4. Have you read the Actuarial Standard Board's PBR for Life Products exposed Actuarial Standard of Practice (ASOP)?

- Yes
- No

5. Have you read the Actuarial Standard Board's Credibility Procedures ASOP (ASOP 25)?

- Yes
- No

6. Have you read the Actuarial Standard Board's exposed ASOP on Modeling?

- Yes
- No

7. Which steps has your company performed to test PBR valuation? (Please check all that apply.)

- Built models and used experience to develop assumptions
- Considered a timeline for implementation
- Determined which products will require Stochastic and Deterministic reserve calculations
- Performed Stochastic and Deterministic Exclusion Tests
- Considered whether or not to offer only products that pass these exclusion tests after the Valuation Manual becomes effective
- Prepared a draft memorandum to comply with VM-31 (which includes, for example, documentation of the valuation assumptions and margins for each major product line subject to a principles-based reserve valuation)
- Participated in the New York or Kansas Experience Studies
- Determined which assumption needed for valuation will be company data, which will be industry-wide data and which will be a blend
- Participated in a VM-20 Impact Study (Towers Watson, ACLI, other)
- None of the above
- Other (please explain)

8. The NAIC's stated objective is to make sure PBR more completely identifies the obligations created by every insurance policy written by an insurer. PBR uses company-specific assumptions (and NAIC prescribed assumptions when appropriate) to better match the level of reserves to risk (in order to "right-size" the reserves), thereby reducing reserves that are overly conservative for some products and increasing reserves that are inadequate for other products. Based on the NAIC objective for PBR, do you believe the level of reserves under PBR will better match the level of risk for your company for the products listed below?

	Yes	No (Too Low)	No (Too High)	Do Not Know	Do Not Offer This Product
Term	<input type="radio"/>				
UL with Secondary Guarantee	<input type="radio"/>				
Indexed UL	<input type="radio"/>				
Other UL	<input type="radio"/>				
Variable Life	<input type="radio"/>				
Whole Life	<input type="radio"/>				
Other (please specify)	<input type="radio"/>				

9. If you answered "no" for any of the products in question 8, please identify the reason you believe the objectives would not be achieved.

	Unreasonable net premium reserve methods / assumptions	Unreasonable deterministic exclusion test methods / assumptions	Unreasonable stochastic exclusion test methods / assumptions	Unreasonable deterministic reserve methods / assumptions	Unreasonable stochastic reserve methods / assumptions	*Other (please explain below)
Term	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
UL with Secondary Guarantee	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Indexed UL	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Other UL	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Variable Life	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Whole Life	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Other (please specify)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

\*Other:

10. If a product passes the deterministic exclusion test and the stochastic exclusion test, it will not be subject to PBR requirements. Do you expect your company will qualify for an exemption from PBR for any of the following products?

	Yes	No	Do Not Know	Do Not Sell
Term	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
UL with Secondary Guarantee	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Indexed UL	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Other UL	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Variable Life	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Whole Life	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Other (please specify)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

11. PBR will have a three-year transition period. If PBR becomes effective 1/1/2016, when will your company begin reporting PBR in your annual statement?

- 2016
- 2017
- 2018
- 2019
- Do not know

12. The Standard Valuation Law and the Valuation Manual will place increased responsibility on the board, senior management and qualified actuaries with respect to the determination of PBR reserves. When will the board be informed of their increased responsibilities under PBR?

- Have already started discussions
- Planning to in the next 12-24 months
- Waiting until the effective date
- Other (please specify)
- Do not know

13. When will senior management be informed of their increased responsibilities under PBR? (The term "senior management" includes the highest ranking officers of an insurance company or group of insurance companies with responsibilities for operating risk, risk assessment and financial reporting.)

- Have already started discussions
- Planning to in the next 12-24 months
- Waiting until the effective date
- Other (please specify)
- Do not know

14. If your company has a current redundant reserve solution in place (securitization, offshore facility, XXX/AXXX captive, etc.), how do you think PBR as defined in the current version of the Valuation Manual will impact the need for this solution for future new business issued after the effective date of PBR?

- No impact
- Reduce impact
- Increase need
- Eliminate need
- Do not know
- No current solution in place

**Section 2 - Resources**

15. Please indicate which of the following best matches the adequacy of your company's current pricing and valuation systems for performing PBR calculations.

	Systems are adequate / no updates needed	Systems will require limited updates or enhancements	Systems will require more substantial updates or enhancements	New systems are under consideration or being purchased to meet requirements	Do not know
Pricing	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Valuation	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

16. How does your company intend to perform PBR calculations? (Please check all that apply.)

- Internal software
- Purchase software
- Contract with consulting firm to perform PBR valuations
- Other (please specify)
- Do not know

17. To what degree will your company's staffing be impacted by PBR implementation?

- Minimal Impact: can handle with current staff
- Medium Impact: will need to make some changes to staff
- Major Impact: will need to hire or contract with subject experts
- Do not know

18. If you anticipate an impact to staffing, please indicate your company's plans to manage the need for additional actuarial resources for each department to handle PBR implementation.

	Reallocate Internal Actuarial Resources	Hire Additional Actuarial Resources	Rely on Assistance from Reinsurers	Rely on Consulting Actuaries	Do Not Know
Valuation	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Pricing	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Asset Liability	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Experience Reporting	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Other (please specify)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

19. Has your company developed training plans for employees in preparation for implementing PBR?

	Yes	No
Actuarial Staff	<input type="radio"/>	<input type="radio"/>
Non-Actuarial Staff	<input type="radio"/>	<input type="radio"/>

20. What are you company's anticipated costs to implement PBR? (i.e., purchasing new systems, upgrading new systems, etc.)

- \$0 - 9,999
- \$10,000 - 50,000
- \$50,001 - 100,000
- \$100,001 - 250,00
- \$250,001 - 500,000
- \$500,001 - 1,000,000
- \$1,000,001 - 5,000,000
- \$5,000,001 - 10,000,000
- > \$10,000,000
- Do not know

21. What are you company's anticipated annual costs once PBR is implemented?

- \$10,000 - 25,000
- \$25,001 - 50,000
- \$50,001 - 100,000
- \$100,001 - 250,000
- \$250,001 - 500,000
- \$500,001 - 1,000,000
- > \$1,000,000
- Do not know

**Section 3 - Mortality Assumptions Setting and Modeling**

22. Does your company currently have a formal approval process (i.e., documentation of development, meeting minutes and clearly identified individuals with approval authority) for the following activities related to valuation?

	Yes	No
Assumptions	<input type="radio"/>	<input type="radio"/>
Models	<input type="radio"/>	<input type="radio"/>

23. Does your company anticipate making changes to any of the following areas in your assumption setting process to comply with VM-20? (Please check all that apply)

- Documentation
- Margin setting
- Credibility analysis
- Internal assumption database
- Determination of assumptions
- Review of assumptions
- Approval of assumptions
- Other (please specify)

24. When determining appropriate mortality assumptions to be used in determining reserves, PBR requires life insurance companies to use company mortality experience to the extent that it is credible. In addition, companies must re-evaluate mortality assumptions for each segment at least every 3 years.

a. How often does your company currently perform mortality studies? (Choose the one that best applies)

- More frequently than annually
- At least every year, but less than 2 years
- At least every 2 years, but less than 3 years
- Every 3 years
- Longer than every 3 years
- Other (please specify, i.e., a company believes it would be exempt.)

b. Does your company have dedicated staff and system resources to perform experience studies?

	Yes	No
Dedicated staff	<input type="radio"/>	<input type="radio"/>
Dedicated system resources	<input type="radio"/>	<input type="radio"/>

c. At this time, how prepared is your company to perform mortality studies to the extent required by PBR?

- Very prepared (able to perform studies)
- Somewhat prepared (have a plan in place and in process of implementing)
- Have developed a plan
- Not prepared
- Do not know

25. For each experience assumption listed below, please indicate whether you anticipate having fully credible experience, will use an industry experience table or anticipate having partially credible experience blending into an industry table.

	Own Credible Experience	Industry Experience Table	Blending at Some Ages and Durations	Do Not Know
Mortality	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Surrender	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Policy Loans	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Premium Patterns	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Company Expense	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

26. VM-30 and VM-31 require life insurance companies to report specific information in the PBR Actuarial Report regarding mortality assumptions used in determining reserves. (VM-31 Section 3 E 4)

a. Is your company familiar with the reporting requirements in VM-30 and VM-31?

- Yes
- No

b. At this time, how prepared is your company to meet the reporting requirements in VM-30 and VM-31?

- Very prepared (able to report currently)
- Somewhat prepared (have a plan in place and in process of implementing)
- Have developed a plan
- Not prepared
- Do not know

27. PBR requires life insurance companies with more than \$50 million in individual life premiums to submit mortality data annually. The requirements for these submissions are described in VM-50 Section 2. The specific data format is described in VM-51 and reflects what is currently requested in voluntary SOA data submissions.

a. Is your company familiar with the requirements of VM-51 and VM-51?

- Yes
- No

b. Is your company already submitting mortality data to the New York or Kansas statistical agent for its mandatory study?

- Yes
- No

c. Does your company currently submit mortality data to SOA data requests?

- Yes
- No

d. At this time, how prepared is your company to meet the requirements in VM-50?

- Very prepared (able to report currently)
- Somewhat prepared (have a plan in place and in process of implementing)
- Have developed a plan
- Not prepared
- Do not know
- Not applicable

28. When setting the mortality assumption, the procedure involves using credibility weighted company experience graded to industry basic tables. The process will involve determining appropriate mortality segments, using an Underwriting Criteria Score or other actuarially sound method to determine the appropriate industry table, applying prescribed margins and blending company experience to industry tables based on credibility levels. Mortality improvement may be included up to the valuation date, but not beyond the valuation date. Please indicate if your company has determined the following pieces of the mortality assumption to be used in a VM-20 reserve calculation (for any products).

	Yes	No
Credibility level	<input type="radio"/>	<input type="radio"/>
Mortality segments	<input type="radio"/>	<input type="radio"/>
Underwriting Criteria Score (if applicable)	<input type="radio"/>	<input type="radio"/>
Other actuarially sound method to subdivide mortality segments (if applicable)	<input type="radio"/>	<input type="radio"/>
Appropriate Industry Table	<input type="radio"/>	<input type="radio"/>
Assumption to be used	<input type="radio"/>	<input type="radio"/>

29. Does your company intend to use mortality improvement from the date of the study to the valuation date?

- Yes
- No
- Do not know

30. How robust is your company's modeling documentation? (For background information on this topic, please see the Society of Actuaries' research study: Actuarial Modeling Controls: A survey of actuarial modeling controls in the context of a model-based valuation framework)

- Very robust
- Not robust, but adequate
- Needs improvement
- Do not know

31. Does your company anticipate using model compression techniques in stochastic modeling to reduce run time or will you run models on a seriatim basis?

- Use model compression techniques
- Seriatim
- Do not know

32. What steps will your company take to make sure your internal models are auditable?

- Will follow use tests, statistical tests, calibration tests and additional requirements (i.e., see IAIS International Core Principle 17) for the use of internal models
- Have Sarbanes-Oxley (SOX) guidelines in place that will address model auditability
- Other (please specify)
- Do not know

#### Section 4 - Product Development Implications

33. Does your company anticipate redesigning products or shifting product mix as a result of PBR?

- Yes
- No
- Do not know

34. When do you intend to notify your marketing and / or sales division(s) that product pricing or design might be affected by PBR?

- Have already started discussions
- Planning to in the next 12-24 months
- Waiting until the effective date
- Other (please specify)
- Do not know

35. When will your product actuaries play an active role in discussions with others in your company (i.e., valuation, management, marketing or sales) regarding the impact of PBR on new product development?

- Have already started discussions
- Planning to in the next 12-24 months
- Waiting until the effective date
- Other (please specify)
- Do not know

36. When does your company plan to have an established process to coordinate efforts between valuation and product actuaries for setting mortality assumptions for the determination of appropriate reserve levels for new products?

- Have already started discussions
- Planning to in the next 12-24 months
- Waiting until the effective date
- Other (please specify)
- Do not know

37. Currently, what does your company rely upon for product pricing?

- Deterministic models (expected or mean results)
- Stochastic models showing tail risk and confidence levels
- Both deterministic and stochastic models are used to set final pricing
- Other (please specify)

38. If stochastic modeling is used for pricing under PBR, will your company stochastically model the following for purposes of setting reserves?

	Yes	No	Do Not Know
Mortality	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Persistency	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Investment Return	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Expenses	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Other (please specify)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

39. Is your current documentation for pricing methodology, assumptions and results sufficient under PBR for the following audiences?

	Yes	No	Do Not Know
For inter-office communications to financial or valuation actuaries	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
For senior management review	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
For review by Board of Directors	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

40. What additional topics would you like to see covered in a follow-up PBR survey?

41. Please provide any additional comments or questions that you have regarding this survey in the box below.