To: Mike Boerner, Chair of the Life Actuarial (A) Task Force
Life Actuarial (A) Task Force Members (LATF)

From: Mike Boerner, Chair of the Valuation Analysis (E) Working Group (VAWG)

Date: October 24, 2018

Re: Principle-Based Reserves (PBR) Recommendations and Referrals to LATF

The purpose of this letter is to provide recommendations and referrals to LATF based on the Valuation Analysis (E) Working Group's review of the 2017 VM-20 Reserves Supplement (Supplement) and PBR Actuarial Reports. Major findings from this review are summarized in the public report titled "2017 Principle-Based Reserves (PBR) Review Report."[1]

Findings for the Supplement included concerns about incomplete/inaccurate reporting, stemming at least partially from confusion regarding requirements. The VAWG has requested that NAIC Resources consider changes to the Supplement design and instructions to make reporting requirements clearer. Recommendations will be referred to LATF to consider sponsoring in a proposal to the Blanks (E) Working Group.

Findings for the PBR Actuarial Reports included concerns regarding 1) organization and communication, 2) information required by VM-31 in the Valuation Manual that was not provided, 3) additional information not provided but needed to evaluate PBR implementation, and 4) other methodology, modeling, or assumption issues. To address these concerns, the VAWG has developed a list of recommended Valuation Manual amendments for referral to LATF for consideration and development (see Table 1 below). If LATF agrees with these amendments, VAWG recommends that LATF make a request for NAIC Resources and the California Office of Principle-Based Reserving (OPBR) to jointly draft Amendment Proposal Forms (APFs) prior to the Spring, 2019 NAIC National Meeting, with assistance from the VM Review Drafting Group as needed.

Table 1 provides the rationale for each recommended amendment, along with drafting considerations (e.g. some items are related and should be considered together). The Valuation Manual section references are from the Jan. 1, 2018 edition.

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[1] The public report titled "2017 Principle-Based Reserves (PBR) Review Report" contained the following statement with respect to confidentiality: The PBR Actuarial Reports are considered to be confidential information under Section 14A of the Standard Valuation Law (Model #820), and may only be disclosed by a commissioner pursuant to Section 14B of Model #820. This report does not contain any company-specific or other company-identifiable information, and any information contained herein has been aggregated in order to protect the confidentiality of the information. The purpose of this report is to provide observations and findings to aid state insurance regulators in their PBR reviews, and provide companies with feedback intended to assist with the preparation of future PBR Actuarial Reports and the VM-20 Reserves Supplement.

Table 1: Recommended Amendments to Address Issues Found During VAWG PBR Review

Item #	Recommended Amendment	2018 VM Section Reference	Rationale for Amendment, and Drafting Considerations
1	Require a statement that documentation on overall governance is readily available upon request.	VM-31 Section 2.D	This statement would help give regulators some assurance that governance processes are in place. VM-31 currently requires only a Senior Management certification. It was found during the review that some companies did not have a fully developed governance process.
2	Provide a description of all riders and supplemental benefits, whether there is a separate premium, and the reserve approach used, i.e. calculated as part of the base policy, or separately	VM-31 Section 3.C.2	VM Section II prescribes how reserves for riders and supplemental benefits are to be determined. It isn't possible to judge whether reserves are appropriate without this information. Many companies provided little or no information on riders and supplemental benefits.
3	Provide a breakdown of modeled business by direct and assumed, target market, distribution channel, and product features	VM-31 Section 3.C.2	This is needed to evaluate lapse and mortality assumptions, as well as aggregation of mortality experience. {Drafting consideration: Consider whether VM-31 Section 3.C.2 is the most appropriate location for this amendment.}
4	Describe the scope/volume of business subject to each underwriting approach (full, accelerated, simplified issue, guaranteed issue), and how the underwriting approach was reflected in the mortality assumptions and margins.	VM-31 Section 3.C.2	This is needed to evaluate mortality assumptions and margins, as well as aggregation of mortality experience. {Ideally, the report would include a thorough treatment of the different underwriting approaches used, including a description of the process, the period of time used, and the level of additional margin, if any, to reflect any increased uncertainty with newer approaches.}
5	Require a more appropriate materiality standard	VM-31 Section 3.C.3.a and VM-20 Section 2.G and possibly other sections in VM-31 and	There are two main concerns regarding materiality that arose from the review of 2017 submissions: 1. A number of companies set a materiality standard based on a percentage of total company reserves or surplus. Effectively this means that an item impacting PBR would not be considered material unless the dollar impact was much greater than the PBR reserve itself. 2. Many companies used simplifications, approximations, and modeling efficiency techniques to calculate reserves, without the required VM-20 Section 2.G support. VM-20

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		VM-20	Section 2.G states that "A company may use simplifications, approximations, and modeling efficiency techniques if the company can demonstrate that the use of such techniques does not understate the reserve by a material amount, and the expected value of the reserve calculated using simplifications, approximations and modeling efficiency techniques is not less than the expected value of the reserve calculated that does not use them". {Drafting considerations: • An amendment has been exposed by the Life Actuarial (A) Task Force that would require companies to set their materiality standard as a percentage of the PBR reserve (APF 2018-39 developed by the CA OPBR). • Should materiality be set in relation to the item being calculated (e.g. NPR, DR, etc.)? • Should the VM-20 Section 2.G requirement be restated in VM-31?}
6	Provide a complete listing of anticipated experience assumptions, margins, and final prudent estimate assumptions, in a spreadsheet.	VM-31 Section 3.D.1 and possibly other sections in VM-31 and VM-20	VM-31 Section 3.D.1 currently requires a summary of valuation assumptions and margins, including a listing of the final prudent estimate valuation assumptions and margins for the major risk factors. However, companies seemed to interpret VM-31 Section 3.D.1 to require a high-level description of assumptions rather than a listing showing the actual assumptions. It was particularly hard to tell what the assumptions were when companies described them as being based on pricing. {Drafting considerations: • The APF should aim to remove confusion between the terms "material risks" and "major risk factor" (which is not defined). Consider removing the term "major risk factor" wherever it appears in VM-31 and VM-20. • Any changes made to this section should be treated along with materiality. • VAWG members felt it would be better to get all assumptions each year rather than have

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			companies go back to locate them during an audit. • Ideally, standard templates would be developed for companies to complete, with catch-all flexibility to capture company assumptions that don't fit neatly within the design of the template(s). However, template development and potential automation of data collection would be a longer-term project.}
7	Provide the date of the most recent experience study for each major risk factor, and years of data included in the study.	VM-31 Section 3.D.1 and VM-20 Section 9.C.2.e	This would allow regulators to see the data periods on which the assumptions are based and how often the company is updating their experience. {Drafting considerations: • VM-20 Section 9.C.2.e requires mortality assumptions to be reviewed and updated as needed at least every 3 years. This should be amended to make it clear that this review requires an experience study. • Changes to VM-31 Section 3.D.1 should be considered along with item 6 since the term "major risk factor" is used.}
8	Provide a listing of all asset and liability modeling software used, including proprietary company-developed models and spreadsheets, in one section of the report.	VM-31 Section 3.D.2.a	This information was dispersed throughout many of the 2017 PBR Actuarial Reports and was not complete in some cases. {The 2019 VM-31 Section 3.C.2.b requires both asset and liability modeling software, but does not mention proprietary models and spreadsheets. The exposed APF 2018-50 developed by the CA OPBR provides additional requirements.}
9	Provide the version of actuarial modeling software used (for vendor-supplied models).	VM-31 Section 3.D.2.a	It is important to keep modeling software up to date with current VM-20 requirements. Providing the version number may help the discussion that modeling results reflect requirements as of the valuation date. A proposed amendment developed by the CA OPBR (Amendment Proposal Form 2018-50) has been exposed to address this. {Follow-up questions: If regulators are given the version number, how will they be able to tell that it reflects PBR requirements as of the valuation date? Could the NAIC annually collect a summary

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			of vendor updates? Drafting consideration: Should VM-31 Section 3.D.2.a also require companies to summarize how the software version being used reflects PBR requirements as well as the extent of any customization implemented by the company?}
10	Include the following items in the model validation section: 1. Tables showing numerical static and dynamic validation results, and comments on these results. 2. A thorough discussion on how the company became comfortable with the model (e.g. specific model controls, independent reviews performed, etc.).	VM-31 Section 3.D.2.e	Many PBR Actuarial Reports did not provide a clear indication of the degree of rigor actually applied in validating models.
11	Provide the proportion of business rated substandard, and whether it was included in the company's mortality study.	VM-31 Section 3.D.3	This is needed to determine whether treatment of substandard policies is appropriate. The treatment of substandard business wasn't discussed or wasn't clear in many of the PBR Actuarial Reports. In some cases, companies did not include justification for scalar factors, margins, adjustments, or other treatment used in modeling substandard business for DR and/or SR.
12	Provide details on the company's credibility calculations using the Buhlmann or Limited Fluctuation Method.	VM-31 Section 3.D.3.f	Without details that allow regulators to follow the calculations, it cannot be determined whether credibility was determined appropriately.
13	Provide a description of and the rationale for the approach taken to aggregate mortality experience.	VM-31 Section 3.D.3.f	Aggregation of mortality experience can have a major impact on the reserve since it impacts credibility, margins, and grading. A proposed amendment developed by the American Academy of Actuaries Life Reserves Working Group (Amendment Proposal Form 2018-17) is under discussion to address this. {Drafting considerations: • There were many issues with the development and modeling of mortality for the DR and SR. Many companies reported very high credibility percentages, and seemed to be aggregating

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			dissimilar experience, which may overstate credibility. • Does the aggregate data actually need to be used somewhere in the setting of individual segment assumptions? If not, what does the increased credibility actually mean? • Should there be guidelines around aggregating: older issue years with distinct underwriting eras, accelerated underwriting with full underwriting, or substandard with standard business? If so, should there be an additional margin? • Should there be guidelines around using reinsurer data for credibility? Should there be an additional margin?}
14	Provide the mortality improvement start date and end date, for both industry and company experience.	VM-31 Section 3.D.3.i	The mortality improvement start date was unclear or incorrect for some companies. Note that the 2019 VM-20 Section 9.C.3.g clarifies that 7/1/15 is the correct start date for the 2015 VBT, and VM-20 Sections 9.C.2.g and 9.C.3.g allow mortality improvement up to the valuation date.
15	Clarify requirements when company experience mortality is higher than the industry table	VM-31 Section 3.D.3.k	For some companies, mortality experience for simplified issue business was higher than the industry limited underwriting table, and they appeared to be grading down to better industry experience.
16	Provide the definition of the expected basis used in all Actual to Expected (A/E) ratios shown in the PBR Actuarial Report	VM-31 Section 3.D.3.m and VM-31 Section 3.D.4.d	A/E ratios provided in the PBR Actuarial Reports were confusing and difficult to interpret since the expected basis was often not provided, and some companies provided multiple sets of A/E ratios. It wasn't always clear what companies were trying to communicate when they showed these ratios. {Drafting considerations: • VM-31 Section 3.D.4.d requires an A/E analysis every 3 years for policyholder behavior. This does not seem consistent with VM-20 Section 9.A.2, which requires companies to periodically update the assumptions as appropriate. • It may not be desirable to have a 3-year requirement for lapse A/Es when most companies seem to be studying lapses more frequently. • VM-31 does not require an A/E analysis for

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			expenses. Consider this with item 20 (if companies are using fully allocated expenses, an A/E analysis may not be needed).}
17	Provide documentation of testing performed to determine whether there were post level term profits, including the assumptions used (premiums and anti-selective mortality and lapses) in the post level term period.	VM-31 Section 3.D.4 and VM-20 Section 9.D.6	Nearly all companies assumed a 100% shock lapse at the end of the level term period, since VM-20 does not allow post-level term profits. However, testing must be done to determine that this is an appropriate assumption. Many companies either did not perform this testing or did not document it. The intent of VM-20 Section 9.D.6 is to disallow post-level term profits, and to require companies to check for and reflect post-level term losses. {Drafting consideration: An amendment to VM-20 Section 9.D.6 may be needed to emphasize that companies are required to check for and reflect post-level term losses.}
18	Provide evidence that the lapse margin increases the reserve	VM-31 Section 3.D.4.e	A number of companies stated that testing was performed to determine the direction of margins that would increase reserves, but results were not shown (or not shown clearly) in the PBR Actuarial Report. The margin must be in the direction that increases the reserve. For a few companies, the margin decreased the reserve. Further, for several companies, the development and/or direction of the lapse margin was not clear. For some Term business, the direction of the margin did not make intuitive sense because it increased lapses and increased the reserve. Evidence is needed to show that this would increase the reserve.
19	Provide results of testing performed to determine the direction of the lapse margin by duration	VM-31 Section 3.D.4.e and possibly VM-20 Section 9.D	The intent of VM-20 is to require the lapse margin to be set by policy duration if this has a material impact on the modeled reserve (VM-20 Section 9.D.1.a). Many companies did not test lapse margin directionality by duration or vary their lapse margins by duration. Generally, for Term business, a pattern of increased lapses in the early durations and decreased lapses thereafter would tend to increase the reserve (due to non-recovered acquisition costs in the early years, and higher death claims thereafter).

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			{Drafting consideration: VM-20 may need an amendment to explicitly state that testing by duration is required.}
20	Provide a statement confirming that expenses were fully allocated	VM-31 Section 3.D.5	VM-20 Section 9.E.1.i requires fully allocated expenses. Many PBR Actuarial Reports were unclear on whether this requirement was met.
21	Clarify whether acquisition costs and commissions are included in the expense assumptions	VM-31 Section 3.D.5	Treatment of acquisition costs and commissions was not clear for many companies. VM-20 Section 9.E.1.m requires acquisition costs to be included for business inforce as of the valuation date. VM-20 Section 7.B.1.e requires commissions to be included in the projected cash flows. If there are no acquisition costs or commissions, this should be shown as $0 in the PBR Actuarial Report.
22	Provide the complete path of net asset earned rates for each model segment calculated for the deterministic reserve, and an explanation of the pattern	VM-31 Section 3.D.6.i	Some companies provided an average NAER, sample NAERs at selected durations, or a high level description of the path of NAERs. The pattern of net asset earned rates was unusual for some companies, and this was not explained in the PBR Actuarial Report.
23	Disclose the asset maturities used in the alternative investment strategy and whether these are in line with the company's actual reinvestment strategy, regardless of which strategy is ultimately used in the final valuation	VM-31 Section 3.D.6.r	VM-31 Section 3.D.6.r currently requires documentation supporting the appropriateness of the model investment strategy compared to the actual investment policy of the company. The asset maturities used in the alternative investment strategy must be in line with the company's actual reinvestment strategy. Several companies modeled the alternative strategy using assets with longer maturities than their actual company strategy, which would tend to lower the reserve. For several other companies, asset maturities used in the company strategy were not provided, so it was unclear whether this issue applies. A proposed amendment (Amendment Proposal Form 2018-53 developed by the CA OPBR) has been exposed to address this.
24	Document whether the company investment strategy or the alternative strategy produces a higher reserve	VM-31 Section 3.D.6.s and possibly VM-20 Section 7.E.1.g	Most companies used the alternative investment strategy to model their DR and SR. Many companies used the alternative strategy without testing whether the company investment strategy would produce a higher reserve, or without showing the results of that testing. It is important to note that the alternative investment strategy is not a safe harbor.

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			{Drafting considerations: Many companies appear to have interpreted VM-20 Section 7.E.1.g and VM-31 Section 3.D.6.s to mean that companies may choose to use the alternative investment strategy, even if using the company strategy would produce a higher reserve. Although this is not the case, both Sections may need amendments to clarify the intent.}
25	Provide details on how the difference between pre- and post-reinsurance minimum reserves are allocated to policies (i.e. how the reserve credit is allocated by reinsurance agreement for Schedule S)	VM-31 Section 3.D.8	This topic is currently being reviewed by LATF for a potential amendment to the Valuation Manual. The VM is not clear on this and there are many possible ways to allocate, so it is advisable for companies to be clear about this in the PBR Actuarial Report.
26	Provide details on assumed YRT reinsurance premium rates	VM-31 Section 3.D.8	This topic is currently being reviewed by LATF for a potential amendment to the Valuation Manual. Modeling of YRT reinsurance premiums varied substantially across companies. {Drafting consideration: A potential requirement (based on CA PBR review) is to model no less than a realistic increase in YRT reinsurance premiums based on likely reinsurer action no later than the likely timeframe for reinsurer review given the modeled results for other assumptions, such as mortality and lapses.}
27	Indicate which (if any) reinsurance counterparties are captives	VM-31 Section 3.D.8.a	This section currently requires the company to name the counterparties to reinsurance agreements included in the calculation of the minimum reserve.
28	For the Stochastic Exclusion Ratio Test (SERT), provide results of the 16 scenarios, present value of benefits, and test ratios both pre- and post-reinsurance.	VM-31 Section 3.D.10.c	Most companies either did not perform or did not report SERT results pre- and post-reinsurance. In nearly all cases, one SERT result was provided, and it wasn't clear whether it was calculated pre- or post-reinsurance. VM-20 requires both SERT tests (see VM-20 Sections 6.A.2.b and 8.D.2). VM-31 Section 3.D.10.c requires "results of the 16 scenarios and the test ratio". This may have caused some confusion on the reporting requirement.
29	State whether sensitivity	VM-31	VM-31 Section 3.D.11.d does not specify whether

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	testing was done using prudent estimate or anticipated experience assumptions	Section 3.D.11.d	margins are to be included in sensitivity testing. An explanation of the assumptions the company used should be provided.
30	Provide the date(s) used to calculate NPR, DR, and SR, along with the date of the assets, liabilities, yield curve, spreads, and default costs	VM-31 Section 3.D.11.g	Many companies did not provide most of this information, and when it was provided, it was difficult to find. Ideally, this would be located in one place in the PBR Actuarial Report. Most companies stated that their valuation date was 12/31/17, but many companies did not provide the date they used to calculate reserves. For companies that did disclose dates, there were a number of cases where assets, liabilities, starting yield curve, spreads, and/or default costs did not line up with the valuation date. Disclosure of these items would allow regulators to: 1) see that the correct prescribed assumptions were used, 2) see that reserve calculations were done as of an allowed date (no earlier than 3 months prior to the valuation date), and 3) check whether the required adjustment to reserves was made if the calculations were done prior to the valuation date. For a valuation performed as of 12/31/XX, assets and liabilities should be as of 12/31/XX, and the starting yield curve, spreads, and default costs should all be those in effect as of 12/31/XX so that the DR and SR are as of 12/31/XX. However, companies may calculate the DR and SR as of an earlier date if the requirements of VM-20 Section 2.E are met. This Section states that "the company may calculate the deterministic reserve and the stochastic reserve as of a date no earlier than three months before the valuation date, using relevant company data, provided an appropriate method is used to adjust those reserves to the valuation date." For example, if a company chose to calculate the DR and SR as of 9/30/XX for a 12/31/XX valuation date, assets and liabilities should be as of 9/30/XX, and the starting yield curve, spreads, and default costs should all be those in effect as of 9/30/XX so that the DR and SR are as of 9/30/XX. The company would then need to use an appropriate method to adjust those reserves to the valuation date of 12/31/XX.

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31	Modify the required language in the certification from the investment officer on investments to encompass both the company strategy and the alternative investment strategy.	VM-31 Section 3.D.13.a	The 2019 VM-31 does not require a certification if the alternative investment strategy was used. {Drafting consideration: Changes to this section should be considered along with any changes made for items 23 and 24.}
32	Consider additional guidance for calculating the Due and Deferred Premium Asset and how it relates to the NPR floor	VM-20 Section 3.D	Companies were not consistently handling the NPR floor and any Due and Deferred Premium Asset when gross premiums were due more frequently than annually. {This was not specifically discussed in the 2017 PBR Review Report, but it was discussed in the VAWG reviews.}
33	Add a Guidance Note on the Stochastic Exclusion Ratio Test	VM-20 Section 6.A.2	Several companies incorrectly described the numerator in the SERT as the biggest difference from the base scenario. The numerator should be the largest adjusted DR for scenarios other than the base scenario, minus the adjusted DR for the base scenario (scenario 9). Using the biggest difference from the base scenario can result in an incorrect SERT ratio.
34	Add language to make it clear that exposure and claim amounts cannot be capped (e.g. capping a 5m claim at 1m) when calculating credibility.	VM-20 Section 9.C.4.a	Capping of exposure and claim amounts can result in more favorable credibility percentages. A proposed amendment (Amendment Proposal Form 2018-42 developed by the CA OPBR) has been exposed to address this.
35	Remove old mortality grading table which applied for valuations on 12/31/16 and prior.	VM-20 Section 9.C.6.b.iii	This table no longer applies and can cause confusion.
36	In the mortality grading table for valuations on or after 1/1/17, consider changes to the column labels or add further explanation to avoid confusion on how the table should be applied.	VM-20 Section 9.C.6.b.iii	Some companies misinterpreted the table and graded to 100% of the applicable industry tables either faster or slower than required.