



**Summary of submissions and policy decisions of the consultation on**

## **Solvency Requirements for Variable Annuities**

This paper summarises the feedback received on the public consultation on Solvency Requirements for Variable Annuities which took place from 05 September to 03 October 2014. It includes the revised set of solvency capital requirements for portfolios of variable annuity policies.

This paper is not a consultation paper.

19 December 2014

## Introduction

1. The Reserve Bank consulted on a specific capital treatment for variable annuities between 05 September and 03 October 2014 and ran two workshops with industry and other interested parties on 29 September and 02 October in Auckland and Wellington respectively. This paper summarises the feedback received from those consultations and presents the near final policy outcome in substance.
2. The aim of the proposed capital treatment was to ensure that insurers offering variable annuity products are backed by appropriately prudent levels of capital while facilitating the establishment of a variable annuity market and thereby supporting innovation in the retirement income sector. The proposal envisaged updating the Reserve Bank's existing Solvency Standard for Life Insurance Business with a new annex permitting the use of internal modelling of the assets and liabilities of variable annuity contracts. The proposal also included specific provisions for capturing the effects of dynamic hedging.
3. Stakeholders were invited to submit their feedback on specific questions or by making general comments. Altogether the Reserve Bank received eight written submissions. This paper summarises the feedback received from those written submissions as well as the workshops and explains how that has affected the final policy outcome.
4. There was general agreement with the Reserve Bank's proposed capital treatment but respondents did seek some clarification on a small number of issues and made a few alternative suggestions. The Reserve Bank has analysed this feedback and made some minor amendments to the draft requirements as consulted on. The final version of the capital requirements is attached to this document. It is currently envisaged that the new requirements will be implemented as a separate Solvency Standard for Variable Annuity Business in Q 1 2015. A Regulatory Impact Statement will be published when the new requirements come into force.
5. This paper is structured as follows. The next section summarises respondents' submissions and the two workshops. That is followed by the Reserve Bank's response to the feedback received. Section three briefly summarises the key features of the final capital requirements and lists the next steps. The revised requirements are attached to this document, bearing in mind that the final version will incorporate them into relevant elements from the Solvency Standard for Life Insurance Business 2014 to form a new stand-alone standard.

## Consultation feedback

6. The Reserve Bank received eight written submissions from both New Zealand and abroad. These came from the insurance industry, an actuarial and financial consultancy, a retirement investment firm and a representative body. An opportunity for further feedback was provided in two workshops organised by the Reserve Bank on 29 September and 02 October in Auckland and Wellington respectively. The following sections summarise the feedback that was received.
7. The feedback was generally positive and supportive. Respondents welcomed the Reserve Bank's proposals to develop specific solvency capital requirements for variable annuity business and the support this would give to the retirement income market. Some respondents pointed out that variable annuities can be risky products that, if managed badly, can lead to significant financial losses and questioned the level of technical expertise available in New Zealand for firms and advisers to manage the complex risks.

8. Respondents who commented on the list of priors for developing specific capital requirements for variable annuities largely agreed with those priors. However, several pointed out that dynamic hedging was not the only possible risk management tool and that the Reserve Bank should recognise that insurers might use alternative risk mitigation methods such as reinsurance. Those who made this point also argued that the requirement to have a hedging programme in place was too narrow and should be broadened to comprise a Board-approved risk management strategy for variable annuity business.
9. There were some mixed views about the proposed involvement of an independent actuary in addition to the appointed actuary. Some of those in favour requested further guidance on the role of the independent actuary vis-à-vis the appointed actuary and pointed out that the pool of relevant expertise was likely to be rather limited in New Zealand. One respondent requested that actuaries from an insurer's auditor firm be allowed to fulfil this role in order to not unnecessarily restrict the pool of expertise. Another submission stressed the lack of experience with, and expertise of, variable annuity products in New Zealand and suggested that the independent actuary should have a demonstrable track record of, for example, five years of experience with variable annuities, acknowledging that this would be likely to require the expertise to be sourced from abroad. One submission argued against an independent actuary on cost grounds. Two other submissions queried whether it would not lead to unnecessary confusion in relation to the role of the appointed actuary. One of those submissions also argued that it could increase the cost of purchasing a variable annuity for policyholders.
10. No respondent raised any fundamental issues with the proposed capital calculation methodology. A few submissions argued for the weighting factor on the capital calculation with dynamic hedging included to be increased from 0.6 to 0.7. It was argued that this alignment with APRA's standard in Australia would reduce the scope for capital arbitration. Some submissions also queried to whom the proposed lower weighting factor of 0.3 during the first two years would apply, i.e. what the definition of a 'start up' insurer, as worded by the consultation document, was. It was asked whether a new entrant with variable annuity products in another market would be considered as a start up insurer in New Zealand and how an insurer with other insurance products but no previous variable annuity product in New Zealand would be classified.
11. Although there was support for the principles-based approach to the variable annuity requirements, some submissions expressed a lack of clarity as regards the depth of analysis required in the actuarial reports and the amount of conservatism or prudence to apply to the risk assessment and the capital calculation. Follow up discussions revealed a preference amongst some for a prescribed value at risk (VAR) or contingent tail expectation (CTE) level to be chosen as a benchmark. Similarly, one submission in particular stressed the importance of the longevity assumption and felt that the proposed requirements did not offer sufficient guidance for the independent actuary.
12. Other feedback focused on how to manage the failure of a variable annuity provider or the closure of a product to new business and whether there should be a separate statutory fund for an insurer's variable annuity business. One respondent stressed the need for regulatory clarity given the long term nature of variable annuity policies.

### **Reserve Bank response to submission feedback**

13. The main suggestions and requests for clarification made in the submissions can be summed up as follows::
  - The Reserve Bank should recognise that there are other risk management tools in addition to dynamic hedging;

- Views on the role of the independent actuary differed with some supporting it while others questioned its usefulness. There should be more clarity as to the role of the independent actuary;
- The weighting factor should be aligned with that used by APRA in Australia;
- More clarity on the definition of a start up company;
- More guidance or clarification on the Reserve Bank's expectations as regards the risk calibration and detail of the risk analysis;
- Additional guidance on the longevity assumption;
- There should be a separate statutory fund for an insurer's variable annuity business; and
- A question as to how the failure of a variable annuity insurer or the phasing out of a variable annuity product would be managed.

#### *Risk management techniques*

14. The Reserve Bank did not intend to prescribe one particular risk management strategy or elevate one above others. Section 1 of the proposed solvency capital requirements for variable annuities stated that the reinsurance recovery risk capital charge had to be added "if appropriate". In other words, if reinsurance is used to transfer all or some of the risk, then the standard's usual reinsurance requirements as per sections 100 to 105 apply. However, the Reserve Bank accepts that there was scope for misunderstanding, particularly since the risk management strategy only referred an insurer's hedging programme.
15. The Reserve Bank has amended the requirements to clarify that it recognises that there are other risk mitigation techniques such as reinsurance and that these remain acceptable as long as the relevant requirements that apply to reinsurance contracts in the Solvency Standard for Life Insurance Business 2014 are met. The Reserve Bank has also revised the requirement to have a Board-approved hedging programme to a Board-approved risk management strategy for variable annuity portfolios that may or may not include a dynamic hedging programme depending on an insurer's risk management strategy. If dynamic hedging is used, further requirements specific to dynamic hedging apply.

#### *Role of the Independent Actuary*

16. The proposal to have an independent actuary involved is seen as crucial by the Reserve Bank. As pointed out by a number of respondents, variable annuity products are not risk free and the experience and expertise with variable annuities or similar products is limited in New Zealand. Independent expertise can usefully complement an insurer's risk assessment and support its appointed actuary and the Reserve Bank in its regulatory tasks. Although this does represent an additional cost which has to be borne by the insurer, in the Reserve Bank's view the benefits outweigh that cost. Preliminary discussions with industry players also indicated that this cost was not seen as unreasonable. Furthermore, the cost can be mitigated by only requiring an independent actuary's report when the risk management strategy is implemented prior to the launch of the variable annuity product and then at a reasonable frequency, e.g. no less than every three years. More frequent assessments may be warranted when there are material changes to the risk management strategy, including the modelling and the models used and the hedging programme where relevant, or the product type that affect the risk profile and are different from normal portfolio changes. The revised set of requirements provides further detail on when an independent actuary's report is required.
17. The point regarding the limited pool of expertise in New Zealand is fully appreciated by the Reserve Bank. While the independent actuary should be independent from the insurer and its appointed actuary, the Reserve Bank does not wish unnecessarily to restrict the choice of independent actuary. An expert from the audit firm used by the insurer, as proposed by one

respondent, is acceptable as long as there is a strict internal separation within the audit firm between the auditors of that particular insurer and the independent actuary. To ensure that only suitably qualified persons take on this role, it is important that the independent actuary can demonstrate a track record or familiarity with the risk management of variable annuities or closely related products. Moreover, as an additional check on the suitability and independence of the independent actuary, the insurer must obtain a formal non-objection notice from the Reserve Bank for its choice of independent actuary.

18. It is also worthwhile making the point that the independent actuary's report is required irrespective of whether dynamic hedging is used as a risk management tool. If the insurer opts to reinsure some or all of the insurance risk, or even self-manage the risk, there is still a need to commission a report by an independent actuary focussing on the risk management strategy, the estimation of the assets and liabilities and capital and comment on the quality and effectiveness on the proposed risk management strategy. If dynamic hedging is used, then the report would also have to assess the effects of that and the quality of the proposed hedging programme.

#### *The weighting factor*

19. The Reserve Bank is open to the suggestion of aligning the upper bound of the weighting factor with the one applied by APRA in Australia. That would mean that, subject to Reserve Bank approval, a factor of up to 0.7 can be attached to the capital outcome with the effects of dynamic hedging included. The upper limit of the factor is not as important as ensuring that solvency capital reflects the risks and the quality and effectiveness of the risk management. The Reserve Bank views attainment of the 0.7 factor as something that is far from automatic. Well established insurers with a sizeable portfolio of variable annuities and high quality risk management processes that include high quality modelling and frequent rebalancing of hedge positions with instruments that can be traded in deep and liquid markets may expect to be given that weighting on their capital outcome with dynamic hedging included. For others, a lower factor is likely to apply. The decision about the weighting factors, however, will be made on a case by case basis after thorough analysis of the insurer's risk management framework, modelling of the assets and liabilities and the effects of dynamic hedging. The independent actuary's report will be crucial in this context and the independent actuary may propose a weighting factor.

#### *Definition of a variable annuity start up*

20. The choice of the term 'start up' has led some to seek further clarification from the Reserve Bank. The purpose of the term was to ensure that new market entrants using dynamic hedging as a risk mitigation technique have stricter capital requirements during their first two years of business than more established variable annuity insurers. This is achieved by capping the weighting factor on the dynamic hedging capital outcome to no more than 0.3 during those first two years. The intention is for this rule to apply to all insurers that have not previously had a variable annuity product in the New Zealand market. The terminology will be amended to reflect this and refer to new entrants who have not previously had a variable annuity product in New Zealand.

#### *Risk calibration and level of prudence*

21. The request for further guidance on the risk calibration and by extension the level of conservatism to apply when assessing risks and calculating the solvency capital requirement touches on an important question. Some regulators prescribe a VAR level of, for example, 99.5 percent per year over one year.

22. The Solvency Standard for Life Insurance Business is not overly prescriptive and relies on actuaries' professional standards to a degree, leaving choices to be made in certain areas. The advantage of this is that solutions can be better tailored to individual circumstances. For example, the Reserve Bank would expect a more conservative calibration to be used where circumstances demand so. However, the flipside is that there is an increased risk of heterogeneous assumptions being made that do not reflect underlying differences in risk but are merely due to differences in subjective judgements. This is what some of the submissions have raised as an issue.
23. The Reserve Bank is sympathetic to the request for more guidance on the risk calibration that it expects and notes that the issue may have broader applicability than variable annuities. The Reserve Bank intends to review the calibration of the Solvency Standard for Life Insurance Business in due course.
24. In the meantime, the Reserve Bank expects a VAR level of 99.5 percent over a one year horizon to be used as minimum starting point when assessing the risks of variable annuity portfolios. Furthermore, the Reserve Bank expects modellers and actuaries to consider whether a more conservative level would be appropriate. That might be necessary to compensate for data limitations or incomplete modelling of all the risks. It is unlikely that a VAR level of less than 99.5 percent over a one year horizon, or its equivalent, would be acceptable to the Reserve Bank. The proposed calibration level should be explained to the Reserve Bank. The new version of the variable annuity attachment clarifies the Reserve Bank's expectations on this point.
25. As a general point, the assessment of capital in respect of Variable Annuities should have regard to all risk factors currently considered within the Solvency Standard for Life Insurance Business 2014 along with any additional risks posed by the Variable Annuity product and the proposed management approach. The calibration of the Solvency Standard for Life Insurance Business 2014 as implied by the required capital factors and prescribed assumptions provide a useful starting point.

*Longevity assumption*

26. The Reserve Bank agrees with the assessment by some respondents regarding the importance of the longevity assumption. Further inquiries with the respondent who requested more guidance revealed that the request was not for a prescribed basis as such but rather to provide some guidance as regards the risk calibration. The guidance on a VAR level discussed above and reference to the general calibration implied by the current Solvency Standard for Life Insurance Business 2014 also applies to longevity risk.

*A separate statutory fund for an insurer's variable annuity business*

27. A small number of submissions stressed the highly risky and complex nature of variable annuity products and one suggested requiring insurers to have a separate statutory fund for their variable annuity business. The Reserve Bank is aware that this is the case in some other jurisdictions, notably Australia. There are advantages and disadvantages of this. While on the one hand it insulates an insurer's other life business from any adverse effects of their variable annuity book, it also prevents any benefits from risk pooling of all life business to be enjoyed.
28. The Reserve Bank notes that life insurance business already requires a separate statutory fund. The highly risky and complex nature of variable annuity policies indeed points to a cautious approach and suggests that any benefits from risk pooling could easily be outweighed by the downsides of mingling it with other life insurance business. The proposed capital treatment of variable annuity policies also only applies to variable annuities and not to

other life insurance policies. That may make the calculation of a combined solvency margin, which would be the case if there was only one statutory fund, difficult. Since a statutory fund is largely a book-keeping concept to ring-fence a portfolio and therefore does not involve any substantial costs, there are also no significant compliance cost reasons to not recommend a separate statutory fund for an insurer's portfolio of variable annuities. The Reserve Bank is therefore of the view that an insurer should have a separate statutory fund for its variable annuity business.

#### *Managing the failure or closure of a variable annuity product*

29. The Reserve Bank notes that managing the failure of an insurer with variable annuity business is not fundamentally different from managing the failure of an insurer with other long term insurance business that is in run off, although it should be acknowledged that variable annuity portfolios consist of high risk and complex policies that are as yet untested in the New Zealand market. The Insurance Prudential Supervision Act contains options for managing such failures.

#### **Final form of variable annuity requirements**

30. The Reserve Bank had envisaged that the set of specific capital requirements for variable annuities would be implemented as an annex to its Solvency Standard for Life Insurance Business. However, after reconsidering the best method for implementing the requirements, the Reserve Bank has now decided that it would be that they be located in a separate and stand-alone Solvency Standard for Variable Annuity Business. This standard would include all the relevant sections from the Solvency Standard for Life Insurance Business 2014 and the set of specific capital requirements for variable annuity business. Use of the new standard would be subject to the Reserve Bank's approval. That approval is subject to the Reserve Bank being convinced that the insurer can meet the requirements as set out in the standard. This decision to opt for a separate solvency standard affects the method of implementing the requirements on variable annuities but not the substance, which was the subject of the consultation.

#### **Summary remarks**

31. Respondents appeared to endorse the Reserve Bank's general proposed approach to calculating the solvency capital requirement for variable annuities and welcomed the support this would give to innovation in the retirement income sphere of the market. Respondents also made a number of constructive points, most of which the Reserve Bank has taken on board. These should improve the design of the proposed solvency capital treatment. The resulting final set of requirements reflects these refinements and is similar to what the Reserve Bank consulted on.
32. In summary it means that:
- an insurer is free to choose their risk mitigation strategy;
  - every variable annuity insurer has to have a risk management strategy that is approved by its Board;
  - the insurer has to commission a report by an Independent Actuary that analyses the risk management strategy including the hedging programme if relevant. To do this, the insurer has to obtain a notice of non-objection from the Reserve Bank regarding the choice of the Independent Actuary. The report prepared by the Independent Actuary has to be submitted to the Reserve Bank;
  - the Independent Actuary's assessment must be done at the launch of a variable annuity product and at least every three years or sooner if there is a material change

to the product offering that affects the product's risk profile or if the risk mitigation strategy is materially changed;

- the Reserve Bank will determine whether the insurer is eligible to avail themselves of this Variable Annuity Standard and the relevant factor weight on the capital outcomes with and without the effects of dynamic hedging included a variable annuity portfolio has to be backed by a separate statutory fund;
- an insurer may only launch a variable annuity product if its solvency capital calculation has been approved by the Reserve Bank of New Zealand; and
- there will be a separate, stand-alone Solvency Standard for Variable Annuity Business.

### **Next steps**

33. This summary of submissions concludes the Reserve Bank's consultation process on variable annuities. The revised set of requirements for variable annuity business is appended to this document. The Reserve Bank plans to issue these requirements as a separate solvency standard in Q1/2015. Apart from the requirements appended to this document, the new Solvency Standard for Variable Annuity Business will draw on and incorporate relevant sections from the existing Solvency Standard for Life Insurance Business. A regulatory impact statement on the variable annuity capital treatment will be published when the new solvency standard is issued.



## Annex 1

### List of consultation questions

- 1 Do you agree with these priors? Please elaborate.
- 2 Do you have any comments on the Reserve Bank's proposal to refrain from prescribing particular modelling methods, distributions and calibration levels?
- 3 Do you agree that the quality and sophistication of the modelling and hedging should affect the capital allowance?
- 4 Do you agree with the proposed approach for determining the capital calculation of variable annuity products when dynamic hedging is used?
- 5 Do you have any comments on the concept of capping this allowance at a predetermined levels and making the actual amount of credit dependent on the quality and sophistication of the underlying modelling and hedging?
- 6 In your view, is the proposed maximum allowance, i.e. the proposed weightings, adequate?
- 7 Do you think the Reserve Bank is right in requiring an actuarial report and a hedging programme?
- 8 Are there any other items that should be included in either report? Please specify with supporting reasons.

## Annex 2

### Draft key requirements for the Reserve Bank's Solvency Standard for Variable Annuity Business

1. The solvency treatment of variable annuity policies must be in accordance with this Standard. For variable annuity policies the results of this Standard replace the Insurance Risk Capital Charge and the Asset Risk Capital Charge with the "Capital Charge for variable annuities" when calculating the Total Solvency Requirement. The Minimum Solvency Capital is determined in accordance with paragraph 34 of the Solvency Standard for Life Insurance Business 2014.
2. Variable annuities are a life insurance policy with unit linked or managed fund investment characteristics and optional benefits for the policyholder. The benefits calculated by reference to the value of the units allocated to the policy, but the benefits may exceed the value of those units in specified circumstances.
3. In order to meet the requirements of this Standard, variable annuity policies must be referable to a separate statutory fund from a **licensed insurer's** other life insurance.
4. Variable annuities require sophisticated modelling of the assets and liabilities and special risk management techniques. The modelling can be done by using stochastic methods, scenario based analysis or a combination of the two and must produce a more conservative capital outcome than that based on Best Estimate Assumptions. Models have to be appropriately documented and validated on a regular basis. The modelling must be based on sufficiently prudent assumptions. Additional prudence must be used for any model deficiencies or residual risks not fully mitigated as part of the insurer's risk management strategy.
5. When calculating the Capital Charge for variable annuities, in accordance with this Standard, the insurer must consider the assets and liabilities simultaneously. The insurer may replace the Prescribed Solvency Assumptions specified in Appendix A of the Solvency Standard for Life Insurance Business 2014 with its own assumptions. Where the insurer opts to do this, any assumptions made have to be sufficiently prudent. The level of prudence chosen by the insurer has to be fully explained. The Reserve Bank's assumptions in Appendix A and those implied with respect to asset risks in section 3.3 of the Solvency Standard for Life Insurance Business 2014 and relevant international standards may serve as useful reference points. The Reserve Bank would expect a level of prudence to be adopted that is at least commensurate with a VAR level of 99.5 percent over a 1 year horizon. Where necessary, a more conservative calibration should be adopted. Reasons may be a lack of data or a high degree of uncertainty.
6. The economic scenarios underpinning the modelling must reflect adverse market outcomes. This can be achieved by considering appropriate and relevant real market data from periods that have experienced unusual significant market stress or by adding stress factors to real market data. The modelling of economic outcomes has to be documented in a clear and transparent way.
7. The prime responsibility, for modelling the assets and liabilities, the risk management strategy, including the identification of risks and the hedging programme, where relevant, and ensuring that the business is supported by appropriately conservative levels of capital lies with the insurer and its **appointed actuary**.

8. In addition to the role of the **appointed actuary**, the insurer must appoint an appropriately qualified and experienced independent actuary acceptable to the Reserve Bank. For the purpose of this requirement, an independent actuary is an actuary different from the insurer's **appointed actuary** and someone who is not involved in any activities related to the insurer's business or variable annuity policies, nor any risk management or hedging activities, including any operational aspects. An actuary employed by the insurer's auditor may be acceptable provided he or she is not directly involved in the firm's role as auditor of the insurer. The independent actuary has to be able to demonstrate relevant expertise. A suitable record of familiarity with variable annuity policies and their management or a closely related product and the required modelling would be expected. Before appointing an independent actuary, the insurer must obtain a notice of 'no objection' from the Reserve Bank.
9. The role of the independent actuary is to provide a detailed analysis of the modelling of the assets and liabilities and the risk management strategy, including any hedging programme, and to propose a factor weight on the capital outcome with dynamic hedging included, if relevant. The independent actuary's report must assess and comment on the economic scenarios and their assumptions and the degree of conservatism assumed in those scenarios and elsewhere in the risk management framework. The report must also assess the appropriateness of any chosen distributions and prudential calibrations. The independent actuary has to take into account any relevant risks, including any business or financial risks, regardless of whether the insurer has included them in the risk management strategy or not. In particular, the independent actuary has to analyse whether the capital outcome is sufficiently prudent. The report must be submitted to the insurer and the Reserve Bank. The Reserve Bank will use the report to determine whether the insurer is eligible to avail themselves of this Standard and, if relevant, the factor weight on the capital outcomes with and without the effects of dynamic hedging included.
10. The report by the independent actuary has to be prepared prior to the launch of a variable annuity product, and at least every three years or at the occurrence of any material changes to the insurer's risk management strategy, its modelling, the models used, any providers involved in the modelling of the liabilities or risk mitigation, the risk profile of the portfolio of variable annuities and any other relevant factors.
11. The Minimum Solvency Capital calculation based on the internal modelling of the liabilities and assets must produce a sufficiently conservative outcome. While risk mitigation methods such as reinsurance may be taken into account, any risks these methods introduce have to be reflected in the capital outcome.
12. To be eligible to apply this Standard to the calculation of its Total Solvency Requirement, an insurer must have a Board-approved risk management strategy for its variable annuity portfolio. The strategy must identify the main risks associated with the variable annuity policies, both at present and in a forward-looking manner, including those resulting from adverse market conditions, insurance and policyholder behavioural developments. It must provide a detailed analysis of the main market, insurance and behavioural risks and the risk management solutions adopted for dealing with those risks. Any other relevant risks not explicitly addressed through the risk management strategy or any residual risks must be identified and the strategy must explain the appropriate level of prudence adopted to manage those risks. Wherever there is uncertainty, the insurer must err on the side of caution. At a minimum the risk management strategy must include a(n):

- a. Overview of business;
  - b. Risk target / risk appetite statement;
  - c. Operational delegations;
  - d. Description of the identified risks;
  - e. Description of the risk management method or tools used;
  - f. In-depth analysis of the current risk position and forward-looking analysis of likely developments covering insurance, market and behavioural risks;
  - g. Description of the approach used for modelling the liabilities and assets;
  - h. Description of any models used including supplier, version, development background and support and back up arrangements;
  - i. Analysis of model parameter estimation;
  - j. Analysis of behavioural risks including lapse rates, basis risk, liquidity risk; any non-hedged risks; operational risk; legal risk; credit risk; longevity risk including mortality improvements, and any hedging imperfections;
  - k. Assessment of the impact on income from fees and charges from adverse economic conditions;
  - l. Explanation of any additional prudential measures taken to compensate for remaining risks, non-hedged risks, periods of unusual market stress or any other reasons; and
  - m. Analysis of any other relevant risks and issues.
  - n. Explanation of risk monitoring arrangements and their effectiveness;
13. If dynamic hedging or any other form of forward-looking hedging is used as a risk management tool, the risk management strategy must include a detailed written hedging programme. This must comprise but is not limited to a(n)
- a. Description of the dynamic hedging arrangements, including operational aspects responsibilities and governance structures in respect of the hedging programme and its effectiveness;
  - b. Frequency of rebalancing and trigger thresholds;
  - c. The market risks to be hedged, i.e. gamma, other first order or second order Greeks;
  - d. Explanation of the financial instruments to be used in the hedging;
  - e. Description of the model used including supplier, version, development background and support and back up arrangements;
  - f. Analysis of model parameter estimation;
  - g. Analysis of behavioural risks including lapse rates, basis risk, liquidity risk; any non-hedged risks; operational risk; legal risk; credit risk; longevity risk and any hedging imperfections;
  - h. Analysis and explanation of the ability to hedge positions in the future and how to cope with periods of illiquidity in markets;
  - i. Analysis and description of the effectiveness of the hedging and monitoring arrangements;
  - j. Extensive discussion and analysis of economic scenarios used for the forward-projections;
  - k. If appropriate, a detailed explanation of the choice of distributions and VaR or conditional tail expectation;
  - l. Assessment of the impact on income from fees and charges from adverse economic conditions;
  - m. Explanation of any additional prudential measures taken to compensate for remaining risks, non-hedged risks, periods of unusual market stress or any other reasons; and
  - n. Analysis of any other relevant risks and issues.

14. The Capital Charge for variable annuities must be calculated as follows:

Capital charge for variable annuities=  $w \cdot \text{KDH} + (1-w) \cdot K$

where

- KDH is the capital charge for variable annuities insurance and asset risk with the effects of dynamic hedging included.
  - K is the capital charge for variable annuity insurance and asset risks without dynamic hedging included. Hedge positions in place at the valuation date can be reflected as per the Reserve Bank's Solvency Standard for Life Insurance Business 2014.
  - w and (1-w) are the weights attached to the respective capital calculations. W is determined by the Reserve Bank and must not exceed 0.7. The Reserve Bank will take the independent actuary's proposed factor weight and into account. For an insurance company that has not been issuing variable annuity policies in the New Zealand market for at least two years, w may not be more than 0.3.
  - if dynamic hedging is not used as a risk mitigation tool, w is zero.
15. The actuarial report by the independent actuary may suggest a factor weight (w) on the capital outcome with the effects of dynamic hedging taken into account. This weight will be confirmed or adjusted by the Reserve Bank. In arriving at a factor weight, the independent actuary must consider and explain the level of prudence reflected in the modelling and the hedging programme. Any unhedged risks must be analysed and the potential impact on the licenced insurer's solvency margin must be quantified. In general, the less prudent the modelling and the hedging, the lower the value w should take.
16. The Total Solvency Requirement for the statutory fund containing the variable annuity business is the total of the following:
- (a) Capital Charge for variable annuities
  - (b) Other Liabilities of the statutory fund
  - (c) Catastrophe Risk Capital Charge (as per Section 3.2)
  - (d) Reinsurance Recovery Risk Capital Charge (as per Section 3.4)
  - (e) Repayable Amount Adjustment determined in accordance with paragraph 44
17. The Capital Charge for Variable Annuities must not be less than the Current Termination Value.
18. Allowance for reinsurance in determining the Capital Charge for Variable Annuity insurance and asset risks, is subject to the requirements of paragraphs 40, 41 and 42 and 44 of the Solvency Standard for Life Insurance Business.
19. All other relevant requirements of the Solvency Standard for Life Insurance Business 2014 continue to apply.