Singapore Actuarial Society

SAS SAP L02

Standard of Actuarial Practice

for

Appointed Actuaries on Valuation of Policy Liabilities for Life Insurance Business

Effective from
1 January 2018

Contents

1   Background and Scope

i.   This document has been prepared as a Standard of Actuarial Practice (SAP) for members of the Singapore Actuarial Society (SAS) appointed as appointed actuaries advising direct life insurance companies on the valuation of policy liabilities of their life businesses as required under section 37 of the Insurance Act of the Republic of Singapore ("the Act"). Hereafter, an Appointed Actuary is a member of the SAS who is approved by the Monetary Authority of Singapore (MAS) under section 31 of the Insurance Act, unless otherwise stated.

This SAP governs the conduct and practice of any member who accepts an appointment as an appointed actuary. If a member has any concerns about the operation of this SAP, then the member should refer them to a member of the Council of the Singapore Actuarial Society.

ii.   It should be clearly borne in mind that the intention of the Insurance Act and the Regulations are to ensure the proper regulation of the insurance industry in Singapore.

iii.   This SAP is principally meant to assist Appointed Actuaries in complying with Insurance (Valuation and Capital) Regulation 2004 (G.N. No. S 498/2004) and Monetary Authority of Singapore (MAS) Notice 319 on Valuation of Policy Liabilities of Life Business. However, all members of the SAS should be guided by this SAP when performing any valuation of policy liabilities of any life insurance company registered in Singapore for any other purposes.

1.1   General Objectives of the SAP

1.1.1   The general objectives of this SAP are:

-   to create a range of accepted actuarial practice which is sufficiently narrow to promote an environment where any two actuaries in the same situation would independently produce results that are not materially different;

-   to establish standards of actuarial practice that are internally consistent (within and across practice areas);

-   to establish standards of actuarial practice that are sufficiently general to be comprehensive and relatively stable over time;

-   to strike a reasonable balance between theoretically precise standards and standards that provide clear practice guidance – an Appointed Actuary should comply with the spirit and intent of the standards and be able to demonstrate such compliance;

-   to foster public confidence in the professionalism of the actuarial profession and in the ability of direct life insurance companies to meet their financial obligations.

1.1.2   In certain situations, the objectives may be mutually inconsistent. Rather than prioritize the objectives, an Appointed Actuary should attempt to balance competing objectives in a reasonable manner.

1.1.3   Some situations or products will not be covered in this SAP. When faced with such a situation or product, an Appointed Actuary should follow the spirit and intent of the SAP, guided by the standards that apply to other products or situations.

1.1.4   Some of the language used in all SAPs is intended to be interpreted in a very specific way in the context of a decision of an Appointed Actuary. In particular, the following verbs are to be understood to convey the actions or reactions indicated:

"Must" means that the indicated action is mandatory and failure to follow the indicated action will constitute a departure from this SAP.

"Should" (or "shall") means that, under normal circumstances, the actuary is expected to follow the indicated action, unless to do so would produce a result that would be inappropriate or would potentially mislead the intended users. If the indicated action is not followed, the Appointed Actuary must disclose that fact and provide the reason for not following the indicated action.

"May" means that the indicated action is not required, nor even necessarily expected, but in certain circumstances is an appropriate activity, possibly among other alternatives. Note that "might" is not used as a synonym for "may", but rather with its normal meaning.

1.1.5   Members of the SAS who undertake activities covered in this SAP should make reference to their compliance with this SAP.

1.2   Key Principles of the Valuation of Policy Liabilities

1.2.1   The key principles underlying the valuation of policy liabilities of the life business an insurance company registered in Singapore (the company) are summarized below. These key principles form a set of necessary, though not sufficient, conditions that help the Appointed Actuary determine if the valuation is in compliance with this SAP. The key principles are also intended to provide guidance to the Appointed Actuary if faced with a situation that is not covered elsewhere in this SAP.

- *Spirit and intent*. The Appointed Actuary must adhere to the spirit and intent of this SAP.

- *Acceptable range of results*. The valuation of liabilities is an estimate rather than an exact measure, and, therefore, there exists an acceptable range of results. It should be noted that, although prudence is generally appropriate, excessive prudence may not be, especially if such prudence results in inappropriate action taken by the management of the company or other

parties .

- *Going concern*. Unless the circumstances clearly indicate that a different approach should be assumed, the valuation should be premised on the company operating as a going concern.

- *Explicit and prospective*. The valuation of liabilities is appropriately determined by an explicit, prospective analysis of the liability cash flows. If using an approximate approach, the Appointed Actuary should be satisfied that a prospective cash flow analysis would validate the appropriateness of the valuation.

- *Comprehensive*. The valuation should include assumptions for all contingencies and factors inherent in the company's in-force business which materially affect the anticipated future cash flows. In particular, the valuation should allow appropriately for the value of any embedded options or guarantees.

- *Prudent without being excessive*. The valuation of liabilities makes provision for the best estimate of the expected experience scenario and for adverse deviations in experience. The provision for adverse deviations (PAD) is necessary to provide an appropriate degree of assurance that the valuation is sufficient without being excessive to provide for the policy liabilities.

1.3 Statutory Responsibility of an Appointed Actuary

1.3.1 It is the responsibility of an Appointed Actuary valuing the insurance policy liabilities of life business for the purpose of compliance with section 37(1)(a) of the Insurance Act to be conversant with the requirements of Regulations and MAS Notices mentioned in paragraph 1 (iii) above and any related notices and guidelines issued by MAS that are applicable at the valuation date. The Appointed Actuary is required to perform an annual valuation of the policy liabilities of the life business of the company, and to prepare a valuation report together with other related returns for submission to the MAS.

1.3.2 The Appointed Actuary must disclose the extent of compliance with the requirements specified by MAS and the reasons for not complying fully with any requirements.

1.3.3 The Appointed Actuary should also conduct and communicate regular valuations of life insurance policy liabilities in order to assess the ongoing solvency of the insurance funds.

1.4 Requirement on the Appointed Actuary

1.4.1 An Appointed Actuary should be conversant with the business of the company and also the general business environment that the company operates in. He should be familiar with the social, economic, environmental and legislative factors that may impact the valuation of the policy liabilities.

1.4.2   In preparing the results of a valuation of policy liabilities an Appointed Actuary should:

- Consider the purpose of the valuation and the appropriate regulatory requirements which apply. Where the valuation basis must meet a minimum standard the Appointed Actuary should consider whether or not a higher policy liability value would be suitable. Where the valuation basis is specified by legislation then this should be stated in the valuation report;

- Ensure the correctness and completeness of data and that appropriate data validation procedures have been carried out and adequately documented;

- Ensure that appropriate valuation methods and processes are used;

- When assessing the policy liabilities of the long-term business of the company have regard to the policyholders' reasonable expectations;

- Adopt appropriate assumptions and confirm explicitly in writing that the assumptions adopted are appropriate;

- Take into account in the valuation, the company's reinsurance arrangements including any financial reinsurance implicit therein and evaluate the implications of these arrangements for the valuation of policy liabilities;

- Include a statement covering which SAS SAPs have been followed.

1.4.3   The areas of practice covered in this SAP are:
(a) Section 2 - Data
(b) Section 3 - Methodology
(c) Section 4 - Assumptions
(d) Section 5 - Reporting

2   Data

i.   An Appointed Actuary should have sufficient confidence that the data used are appropriate, complete and accurate, to be able to conduct a valuation of policy liabilities which produces reliable results.

ii.   To do so, the Appointed Actuary will need to examine many features of the data, including but not limited to the following:

-   Reconcilability of the data with other data, including data used for previous valuations of policy liabilities and movement data over the inter-valuation periods;

-   Consistency between the data and the corresponding figures in the audited accounts;

-   Averages – the reasonableness of the change in the average age, sum assured, and premium size over the inter-valuation period;

-   Aggregates – the reasonableness of the change in the total sum assured, premiums and number of policies in the whole portfolio or specific policy classes over the inter-valuation period;

-   Accuracy of individual policy data when random checks are performed against the policy files and the information in the administration system, with particular attention to the accuracy of surrender values if policy surrender values are used as proxies to the policy liabilities;

-   No unusual values, for example, impossible dates of birth or policy inception dates, very large sums assured or premiums,;

-   Accuracy of data on reinsurance coverage in cases where policy liabilities are to be calculated net of reinsurance.

2.1   Relevant Policies

2.1.1   The relevant policies for the valuation are those which are in-force at the valuation date, including those whose issue is then committed, or which were in-force earlier and which could generate cash flow after the balance sheet date. No policy liabilities are required in respect of other policies expected to be issued after that date, whether or not they are expected to be profitable.

2.1.2   An Appointed Actuary should be aware of the accounting practice for policies in the process of termination, for whatever reason, to ensure that these policies are not inadvertently left out in the valuation if the claim liability has not been fully accounted for in the outgo relating to the valuation period.

2.2 Errors and Omissions

2.2.1 Any material errors in the data should be adjusted for and any material omissions must be added back into the data. An Appointed Actuary should also make recommendations on how such errors and omissions could be avoided in the future.

2.2.2 If an Appointed Actuary is unable to establish that the data used are appropriate, complete and accurate, the Appointed Actuary should consider if it is appropriate to set up extra policy liabilities to allow for the data deficiencies.

3 Methodology

i.   An Appointed Actuary should calculate the policy liabilities in accordance with the discounted prospective cash-flow method prescribed in the Insurance (Valuation and Capital) Regulations 2004. Further elaboration of the method can be found in the MAS Notice 319.

3.1 Term of Liabilities

3.1.1   The starting point to derive the term of a policy's liabilities is the contractual term of the policy. An Appointed Actuary should then take account of any options in the contract when deciding whether the term of a policy's liabilities should be extended beyond the contract term.

3.1.2   The term of a policy's liabilities takes account of all the adjustments made to the policy on renewal before the valuation date, and future adjustments if appropriate.

3.1.3   If the term of the liabilities is not evident, and if selection of a longer term would reduce policy liabilities, then the Appointed Actuary would be cautious in making such a selection. On the other hand, if selection of a longer term would increase those liabilities, then the Appointed Actuary would usually select the longer term. Substance would supersede form in the selection.

3.1.4   For example, in most circumstances, the above implies that:

(a)   For a whole of life and endowment policy, the term of the policy's liabilities is the outstanding duration of the policy.

(b)   For a term policy with renewable options, the term of the policy's liabilities may be longer than the contractual term. In projecting the cash flows beyond the contractual term, the Appointed Actuary needs to take into account of the exercise of renewable options at the end of the contractual term and the ability to change the premium rates on renewal. Any constraint that the company may face in altering the rates, needs to be considered.

(c)   For a group policy, the term is usually the duration to the next renewal date, unless onerous premium or other guarantees apply on renewal.

3.2   Cash Flow Comprised in the Policy Liabilities

3.2.1   The discounted prospective cash flow method requires explicit projection of expected future payments and receipts over the duration of the policy.

3.2.2   This should include, where applicable, the following parameters:

- Premium;

- Investment income and expenses (if not allowed for elsewhere);

- Mortality and morbidity benefits;

- Survival and maturity benefits;

- Surrender benefits;

- Future bonus payments, where appropriate, together with future transfer to Shareholders;

- Distribution costs;

- Management expenses;

- Claims expenses if not already included as part of management expenses;

- Premiums payment to, and claims recoveries from, reinsurance counterparty;

- Cost of options and guarantees; and

- Taxation.

3.2.3   If the Appointed Actuary is of the view that certain parameters are immaterial to the valuation of policy liabilities, they need not be explicitly included in the projection.

3.3   Valuation of Policyholders' Future Discretionary Benefits

3.3.1   The valuation of participating policyholders' bonuses must ensure that reserves are sufficient to provide for all guaranteed benefits (including bonuses declared to date), in accordance with the Insurance (Valuation and Capital) Regulation 2004. In addition to this, an Appointed Actuary must ensure that a suitable allowance is made in the valuation for future bonuses which are expected to be allocated to par policies.

An Appointed Actuary should ensure that the bonus rates used in determining the policy liabilities of the participating fund are consistent with other aspects of the valuation of the fund. Of particular importance is the relationship between the assumed future bonus rates and the discount rates.

Where an Appointed Actuary determines that it is appropriate to use bonus rates other than those which are currently in-force (either higher or lower), the Appointed Actuary must highlight in his report to the board of directors of the company (the Board) the assumptions adopted, the rationale for the assumption and any assumptions that the Appointed Actuary has made, either implicitly or explicitly, about the way the bonus rates might be managed in the future in accordance with the Internal Governance Policy of the participating fund.

3.3.2   The valuation of universal life policyholders' benefits must ensure that reserves are sufficient to provide for future crediting rates which are expected to be credited to universal life policies.

An Appointed Actuary should ensure that the crediting rates used in determining the best estimate liabilities for universal life business are consistent with other aspects of the valuation of the product. Of particular importance is the relationship between the assumed future crediting rate or rates and the discount rates.

Where the Appointed Actuary determines that it is appropriate to use a crediting rate other than those which are currently in-force (either higher or lower), the Appointed Actuary should take into consideration the way the crediting rates might be managed in the future in accordance with the company's internal policy.

3.4   Reinsurance

3.4.1   The recovery on account of reinsurance ceded should take account of the financial condition of the reinsurer.

3.4.2   The Appointed Actuary should consider the possibility of recapture or commutation of the reinsurance treaty by the company or reinsurer especially in cases where this will give significant benefit to the reinsurer, or will result in significant cost to the company.

3.5   Retrospective Premium, Commission and Similar Adjustment

3.5.1   In determining the value of a contractual right of the company to future premiums which depends on past claims experience, the Appointed Actuary should take account of the likelihood of such premiums being paid by the policyholder.

3.5.2   Similarly, in determining the value of future commission claw-back payments, an Appointed Actuary should take account of the ability of the company to recover these amounts from the intermediary.

3.6   Experience Rating Refunds

3.6.1   The liability for experience rating refunds would take account of

- The assumptions in calculating the policy liabilities in respect of those matters which determine experience rate refunds;

- The difference between the basis for policy liabilities and the corresponding basis in the experience rating; and

- Any cross-rating across coverages in the experience rating.

3.6.2   The experience rating refund element of the policy liabilities would not be negative except to the extent that in settlement it may be offset against another liability or recovered from policyholders.

3.7   Surrender Value

3.7.1   Although there is no requirement to set the policy liability to be at least equal to the surrender value for each policy, the surrender value of the policy at the valuation date could be used as a proxy to the policy liability if and only if the approximation of the policy liability using the cash flow method introduces too much uncertainty.

3.8   Approximation and Simplified Methods

3.8.1   The valuation should be carried out on a policy by policy basis, and taking into account the specific circumstances of each policy unless approximation methods can be justified on the grounds of non-understatement of policy liabilities and immateriality of the part of the company's portfolio to which such methods are applied.

3.8.2   Examples of approximation methods are:

- Use of model points representing groups of homogeneous insurance policies;

- Using the surrender value as a proxy for the policy liability for immaterial policies; or

- Assuming all policies starts at middle of the calendar year instead of the actual inception date.

3.8.3   Goodness of fit tests or reasonableness checks should be conducted to ensure appropriateness of the approximations and that the approximations do not lead to any understating of policy liabilities.

3.8.4   The goodness of fit test should be carried out on a reasonably sizeable number of sample policies for it to be statistically credible.

3.8.5   The goodness of fit test should be based on the accurate policy by policy computation of the sample policies for comparison with the results derived using the approximate approach.

3.8.6   Simplified methods may be used for products that are immaterial in the company's portfolio.

3.8.7   Examples of simplifications are:

- Use of unearned premium or a percentage of annual premium to determine the policy liabilities;

- Use the valuation method for another product, which has close resemblance to the product, to value the policies.

3.8.8   Where simplified methods are used in determining policy liabilities, an Appointed Actuary should ensure that the use of such methods are appropriate and would not lead to understating of policy liabilities.

3.8.9   The use of approximation and simplification should be reviewed at sufficiently regular intervals to ensure that the previous test or checks are still valid given the change in liability profile or products that are included in the approximations and simplifications.

3.9   Additional Requirements for Participating Business

3.9.1   The assumed cash flow from policyholder bonuses would be that from both periodic (usually annual) bonuses, and terminal and other deferred bonuses, and including that from the related transfers from the participating fund to the surplus account.

3.9.2   The policy liabilities need not make provision for adverse deviations to the extent that the company can offset its effect by adjustments to policyholder bonuses, premium rates, and benefits. The company's contractual right of such offset may be constrained by commercial, regulatory or operational factors.

3.10   Investment-Linked Business

3.10.1 The policy liability can be broken into two parts, namely the unit reserve and the non-unit reserve.

3.10.2 The unit reserve can be calculated as

(a) The value of the underlying assets backing the units relating to the policies.

(b) If there is a shortfall in the actual number of units from the number obliged and committed by the company to the policy owners, an additional unit reserve has to be established to account for the shortfall.

(c) The value of the additional reserve is calculated as the number of shortfall units multiply by the bid price of the units.

3.10.3 The non-unit reserve is a cash flow reserve taking account of all future income and outgo of the policy over the term of the liability.

3.10.4 All future income and outgo should account for:

- Contractual policy obligations such as death benefits, rider benefits, surrender benefits, maturity payout and any policy options

- Expenses such as commissions, sales related expenses, management expenses and taxes; and

- Allowance for future income such as fees and charges, with due consideration as to any contractual expense guarantees and the ability of the company to otherwise increase future charges.

It should be noted that, although the aggregate reserve for a policy cannot be negative, the non-unit reserve in itself may be negative. The negative non-unit reserve from one policy can be used to offset the unit reserve of that policy (however, the Appointed Actuary should consider the value of the surrender charge). However the negative non-unit reserve of a policy cannot be used to offset the positive non-unit reserve of a separate policy.

3.11   Group Business

3.11.1 Group insurance is an arrangement whereby the members of a group, and sometimes their dependents, are insured under a master policy or contract. In group insurance, where contracts are often the result of negotiation between the group policyholder and the company, it is especially important that the Appointed Actuary of the company be familiar with the provisions of each contract, so that all risks may be appropriately reflected in the valuation of the policy liabilities.

3.11.2 The experience refund should be factored in as a benefit in the valuation, whether or not it is only payable as an offset against future premiums.

3.11.3 For a group insurance contract where the participants enjoy the right of terminating their participation at any time, such as for group creditors contract, the term of the liability should be extended and applied for an individual optionally renewable policy.

3.11.4 Other considerations that apply to individual policies such as policy options and rights to cancel policy will also apply to group contracts where such features or restrictions are made available to the group contract.

3.12   Incurred But Not Reported Claims

3.12.1 An Appointed Actuary should account for the outstanding incurred claims and "incurred but not reported claims" ("IBNR") in the policy liability.

3.12.2 For the derivation of outstanding incurred claims or IBNR, the Appointed Actuary should refer to the "Standard of Actuarial Practice for the valuation of general insurance business" for the method.

3.13   Software Used

3.13.1 The valuation system used in the calculation of policy liabilities must apply methods and assumptions correctly, e.g. age definitions, timing of accrued bonuses, etc.

3.13.2 The valuation system used should also be tested thoroughly on a regular basis to ensure that it is stable, reliable and robust.

3.13.3 An Appointed Actuary must ensure that there are sufficient controls in place for software user access and change management.

4 Assumptions

4.1 Best Estimate Assumptions

4.1.1 Best estimate assumptions are assumptions about future experience which are made by an Appointed Actuary using professional judgment, training and experience and having regard to available statistical and other evidence and that are neither deliberately overstated nor deliberately understated.

4.1.2 The expected future payment and receipts should be determined using best estimate assumptions for all relevant parameters.

4.1.3 The best estimate assumptions made should have regard to:

- the experience of the company, with particular reference to significant aspects of recent experience, where experience should be monitored at least annually for risks that are material to the valuation of the business;

- pricing assumptions for new business;

- relevant industry experience;

- the comparison of previous best estimate assumptions with actual results;

- the credibility of data;

- the expected future distribution of outcomes;

- likely future trends;

- the interaction of assumptions e.g. mortality and lapses, asset mix and investment returns;

- the impact of reinsurance arrangements; and

- possible correlations between assumptions, for example:

    • investment return and lapse; and

    • inflation and investment return.

4.2   Risk Free Discount Rate

4.2.1   There are various approaches in determining the market yield of Singapore Government Securities (SGS), the acceptable practice would include the following approaches:

(a) Derive spot yield from reliable market source such as Bloomberg or Reuters by stripping the SGS yield curve of the coupons.

(b) Derive market yield for the duration using the SGS benchmark issues (i.e. At duration 1, 2, 5, 7 and 10 years), and apply linear interpolation for market yield in between these benchmark issues.

(c) Derive market yield by selecting the SGS with the closest matching duration. There may be some subjectivity in choosing the appropriate bonds at times.

4.2.2   Where a change in approach is taken, an Appointed Actuary must state this in the report.

4.2.3   It should be noted that the long term discount rate will probably be the most significant assumption in the valuation. If the application of the interest rate prescribed in the legislation would trigger inappropriate action by management of the company or others, an Appointed Actuary should discuss the situation with MAS. An example of when such a situation may occur could be a large increase in long term interest rates and a significant fall in equity values.

4.3   Best Estimate Investment Returns

4.3.1   Best estimate investment returns shall be used as the discount rates in determining the best estimate liability in respect of a participating and universal life policy.

4.3.2   This best estimate investment return should be based on the expected investment returns of assets backing the policy liabilities of the participating fund and universal life portfolio. This should take into account the effects of:

- Asset mix as at the valuation date and the intended asset mix based on the company's investment policy;

- Market yields of government bonds;

- Credit risk premium reflective of the company's bond profiles;

- Expected rental income, adjusted for accrued change in market value, for property investments;

- Equity risk premium based on the outlook for the equity markets; and

- Investment expenses, if this had not been included in the management

expenses used for valuation of the policy liabilities.

4.4   Mortality

4.4.1   The best estimate of insured lives' mortality experience should take into consideration, where appropriate:

- The age, gender, smoking habit, health, and lifestyle of the insured lives in the portfolio;

- Duration since issue of the policy;

- Plan of insurance and its benefit provided;

- The company's underwriting practice (that of its reinsurer for facultative reinsurance), including, if applicable to the policy, the absence of underwriting or less stringent underwriting for a group of simultaneously sold policies;

- The size of the policy;

- The company's distribution system and other marketing practice;

- The effect of any positive or negative selection at inception, and any selective lapses that may be anticipated;

- The past mortality experience of the portfolio concerned, bearing in mind that future mortality experience may be affected by changes in the company's practices, as detailed above;

- Future improvement in mortality rates; and

- Consistency across products (where packaged).

4.4.2   An Appointed Actuary may use different mortality rates for different portfolios, when appropriate. For example, the portfolio may be segregated by sex, and smoking status (smoker, non-Smoker, and 'unknown smoking status').

4.5   Annuity mortality

4.5.1   The best estimate of annuitant mortality should take into consideration, where appropriate:

- The age, sex, smoking habit, health, and lifestyle of the annuitants;

- Size of premium;

- The benefit provided by the annuity plan;

- The past mortality experience of the portfolio, and future expected

improvements in mortality; and

- Whether it is a compulsory or voluntary plan;

and should include the effect of any anti-selection resulting from the annuitant's option to select the timing, form, or amount of annuity payment, or to commute annuity payments.

4.6 Morbidity

4.6.1 The best estimate of insurance morbidity and critical illness experience should take into consideration, where appropriate:

- The age, sex, smoking habit, occupation, industry, health, and lifestyle of the insured lives;

- Duration since issue of the policy;

- In the case of income replacement insurance, definition of disability, unemployment levels, and in the case of an outstanding claim, cause of disability;

- Plan of insurance and its benefit provided, including elimination period, guarantees, deductibles, coinsurance, return-of-premium benefits, and benefit limits, indexation, and offsets;

- The company's underwriting practice (that of its reinsurer for facultative reinsurance), including, if applicable to the policy, the absence of underwriting or less stringent underwriting for a group of simultaneously sold policies;

- The size of the policy;

- Seasonal variations;

- In the case of group insurance, participation level;

- Environmental factors, such as a change in the offset to government benefits; and

- Past experience of the portfolio, adjusted for changes in any of the above factors, and for any expected future deterioration in experience;

and should include the effect of any anti-selection. For accelerated critical illness policies, it would be normal to use one table that combines the claim rate due to death and/or critical illness.

4.7   Withdrawal, Partial Withdrawal and Premium Holiday

4.7.1   The best estimates of withdrawal, partial withdrawal and premium holiday rates should take into consideration, where appropriate

- Policy plan and options;

- The life insured's attained age;

- Duration since issue of the policy;

- Method of payment and frequency of premiums;

- Premium paying status;

- Policy size;

- The policy's competitiveness, surrender charges, persistency bonuses, taxation upon withdrawal, and other incentives and disincentives to withdrawal;

- Policyholder and sales representative sophistication;

- The company's distribution system and its commission, conversion, replacement, and other marketing practices;

- Environmental factors; and

- The interest rate scenario.

4.7.2   The company's withdrawal experience would provide the starting point for setting a best estimate assumption. An Appointed Actuary should consider the extent to which the experience is credible and pertinent to the current valuation before setting an assumption. Where such experience is unavailable due to various reasons, e.g. new products, an Appointed Actuary may like to refer to the company's experience in other products with similar characteristics in deriving these assumptions. Examples when past experience may not be available or appropriate include, but are not restricted to cases such as

- When changes in interest rates or pricing mortality mean that policyholders would be best advised to surrender their existing policy and repurchase future cover at a cheaper cost. Such an option may only be available to lives in good health, generating a very high selective lapse, and a significantly increased mortality rate for renewing policies;

- Lapses at very long duration for level premium term assurance contracts may be much reduced, or may be restricted to lives in good health, so that few death claims will be avoided; and

- Lapses in respect of existing types of policy sold using a different distribution

channel.

4.7.3   A "cliff" is a sudden significant increase in the benefit available at withdrawal. That increase may result from increase in cash value, decrease in surrender charge, or availability of a maturity benefit or persistency bonus. Unless there is pertinent persistency experience data to the contrary, an Appointed Actuary's best estimate withdrawal rates would grade to zero as the cliff approaches and remains at zero for an interval before the cliff is reached. After the cliff an assumption of non-zero withdrawal rates would normally be re-introduced. The same applies to a return of premium benefit in life insurance or in accident and sickness insurance, with modification in the latter case if the benefit is contingent upon zero claims or reduced by the amount of claims.

4.8   Anti-Selective Lapse

4.8.1   An Appointed Actuary should be aware of the situations giving rise to "anti-selective lapse" that may have an impact on the future claims experience of the portfolio. In respect of life insurance or health insurance coverage, it is generally rational for a policyholder to lapse if he is healthy and to stay if he is unhealthy. However, policyholders will make decisions in their own perceived interest. The policyholder may not know the true state of his or her health and may imprudently or inappropriately decide to act with short-term advantage, but with long-term detriment. For example, an unhealthy policyholder may lapse when the premium increases perceiving the policy as no longer affordable and a healthy policyholder may continue a policy which could be replaced by a superior one due to ignorance or inertia.

4.8.2   To determine the impact of anti-selective lapse would require re-underwriting of the inforce policyholders or study of the health conditions of those who lapsed, neither of which are practical, but the impact will be reflected in future actual mortality. However, when anti-selective lapses can reasonably be expected, at a greater level than has been the case in the past, the Appointed Actuary should make appropriate allowance in both future lapse rates and in future mortality and/or morbidity.

4.8.3   An Appointed Actuary should exercise prudence in the recognition of any improvements in mortality or morbidity assumptions arising from non-occurrence of anti-selective lapses and should base the best estimate assumptions on reliable information.

4.8.4   The premise to an Appointed Actuary's assumptions would be that policyholder decisions:

- Will tend to serve their perceived interest; and

- Not serve the company's interest unless it is aligned with the policyholder's own interest.

4.8.5   Some examples, where the perceived interest of the healthy policyholder may be to lapse, are:

-    Premium increase at renewal of term insurance;

-    An unfavourable underwriting decision at renewal of re-entry term insurance;

-    A benefit decrease or premium increase of adjustable insurance; (see term of liability)

-    A premium needed to avoid termination of universal life insurance with exhausted funding;

-    A reduction in policyholder dividend scale;

-    An offer or availability of a superior replacement policy, such as by the creation of a preferred underwriting class;

-    A significant but temporary increase (spike) in non-forfeiture value;

-    A downgrade in the company's credit rating;

-    A fall in market value of linked assets; and

-    A rise in market interest rates may give rise to incentive to surrender single premium endowment, because of the availability of a superior replacement policy.

4.8.6   An Appointed Actuary should be alert to the above conditions and review the related best estimate assumptions as is necessary to reflect expected future experience of the portfolio.

4.9   Expenses

4.9.1   An Appointed Actuary must select a best estimate assumption which provides for the management expense of the relevant policies, including overhead expenses, and distribution expenses.

4.9.2   Management expenses should include all relevant expenses, e.g. maintenance and claims handling expenses, if these are not already considered within other parts of the valuation, e.g. claims assumptions.

4.9.3   The assumption would provide for future expense inflation. Standard inflation is not specific to an company's portfolio. It is an external factor operating in the economy at large. It is appropriate to refer to publicly available information on historic wage and price inflation and economists' forecasts to estimate the future wage and price inflation rates.

4.9.4   A stable company's experience is pertinent if its expense allocation is appropriate for valuation of policy liabilities (or if an Appointed Actuary can correct the

inappropriateness, e.g., by reallocating corporate expense to operating lines of business).

4.9.5 Any likely deterioration in the future experience should be provided for.

4.9.6 A particular company may have an expectation of reduced expense rates, but the Appointed Actuary should anticipate only a reduction which is supported by credible evidence or actions.

4.9.7 The company incurs neither cash rental expense nor cash rental income on properties which it owns and occupies. An Appointed Actuary should take into account of such rental in the expense assumption and consequently such income to be factored into the best estimate investment return assumption.

4.10 Taxation and Shareholder Transfers

4.10.1 All future taxes and future shareholder transfers, except those which are payable on surplus arising under the same basis as the regulatory valuation basis, must be allowed for in the valuation of policy liabilities, Examples include tax on investment income (where applicable) and tax on par fund bonus distribution.

4.10.2 For par fund, tax must be factored in to avoid overestimation of the bonus supportable by the par fund.

4.11 Bonus, Dividend and Universal Life Crediting Rates

4.11.1 In determining the appropriate allowance for future bonuses, an Appointed Actuary should have regard to:

- Any contractual restrictions on bonus rates (for example, guaranteed minimum bonus rates);

- Recent bonus investigations;

- The current bonus scale in-force;

- The Company's Internal Governance Policy (IGP);

- The assets of the fund;

- Bonus rates illustrated to policyholders; and

- Any practical or commercial constraints which impact the Company's ability to vary bonus rates.

Where bonus rates other than those which are currently in-force are used in the valuation, an Appointed Actuary should consider if there are any policies whose payouts will be determined by the actual rates in-force. Where this is the case, an additional reserve for those policies, based on the actual bonus rates in-force, may be required. This situation might arise, for example, where the Appointed

Actuary makes a suitable assumption about bonus rates changing over time, but there are policies close to maturity who will receive a payout before any future changes to bonus rates can be affected.

The valuation of future bonuses should include any known special or one-off bonuses.

4.11.2 In determining the appropriate allowance for future Universal Life crediting rates, an Appointed Actuary should have regard to:

- Any contractual restrictions on crediting rates (for example, guaranteed minimum crediting rates);

- The current crediting rates in-force;

- The Company's internal policy for crediting rates;

- The assets of the fund;

- Crediting rates illustrated to policyholders; and

- Any practical or commercial constraints which impact the Company's ability to vary crediting rates.

The valuation of future crediting rates should include any known special or one-off rates.

4.12   Exercise of Policyholder Option

4.12.1 Examples of policyholder options are

- The conversion of group insurance or individual term insurance;

- The election of a settlement option in individual life insurance;

- To purchase an annuity at a guaranteed rate;

- The purchase of additional insurance or coverage without underwriting; and

- The selection of the amount of premiums for, or to make partial withdrawal from, universal life insurance.

4.12.2 Where there is a reasonable expectation of policyholders exercising contractual options or extra-contractual options, an Appointed Actuary should select a best estimate assumption of this.

4.12.3 The Appointed Actuary's best estimate would depend on:

- The life insured's attained age;

- Duration since issue of the policy;

- Plan of insurance and its benefits provided;

- Historical premium payment patterns;

- Method of premium payment;

- Sophistication of the policyholder and the intermediary;

- Perceived or actual self-interest of the policyholder and the intermediary;

- The policy's competitiveness; and

- The company's distribution system and other marketing practices;

and would make provision for anti-selection.

4.12.4 An Appointed Actuary should make provision for adverse deviations by testing the effect on policy liabilities of plausible alternative assumptions of policyholder exercise of options and adopting one with relatively high policy liabilities.

4.12.5 Where financial guarantees or options exist, the Appointed Actuary should consider the need to use stochastic methods to assess the liability value.

4.13 Provisions for Adverse Deviation (PAD)

4.13.1 The PAD represents an additional component of the liability value aimed at deriving an adequate level of the value of insurance liabilities. PADs serve as a cushion against the mis-estimation of the best estimate assumptions.

4.13.2 An Appointed Actuary should exercise professional judgement in determining the appropriate level of PADs. The prime consideration must be the protection of the interests of existing policyholders, including the reasonable expectations of participating policyholders. The Appointed Actuary must, therefore, consider the range of plausible future scenarios and ensure that the reserve is sufficient in all cases. The use of low PADs may mean that the policy liability will be insufficient to provide for policyholders in a quite plausible adverse scenario. However, the use of high PADs, provides greater security of policyholder interests, but would result in tying up of greater amounts of capital. The Appointed Actuary might face the question of how much security is required and be conscious that there can be no absolute guarantee against all possible adverse outcomes.

4.13.3 The overall objective of setting PADs should be to enhance the protection provided to policyholder benefits. On a conceptual framework, the impact of incorporation of PADs should be to increase the statistical confidence of policy liabilities. For clarity, this principle is to be applied for the overall policy liability rather than for each and every parameter.

4.13.4 While setting PADs, an Appointed Actuary should consider factors such as:

- The past experience of the company or portfolio concerned and market experience (if available);

- Relevant experience available from jurisdictions other than Singapore (which should include consideration of both deflationary and inflationary scenarios);

- The extent to which falling or rising interest rates may threaten the ability to meet obligations and where such risk cannot be matched or mitigated;

- More general interaction between assets and liabilities;

- The impact of policyholder options; and

- Avoiding being influenced unduly by personal opinion held a priori concerning the future (e.g. of mortality experience) and to ensure a full range of plausible adverse scenarios.

4.13.5 Whatever approach is adopted an Appointed Actuary must be prepared to quantify and justify the overall PADs used in the valuation as providing an appropriate level of prudence to enhance the protection of policyholder benefits, from the impact of the adverse experience. In such a demonstration the Appointed Actuary may:

- Rely on the overall PADs rather than just the PAD associated with a particular parameter, but only if he/she is of the view that the risk of coincident occurrence of adverse deviations in several parameters is expected to be low;

- Have regard to the extent to which increases in liabilities may be offset by compensating increases in asset values;

- The ability of management to react to adverse experience, for example by changing asset mix, reducing or eliminating bonuses (subject to maintaining policyholders reasonable expectations), increase mortality charges where there is discretion to do so, or more extremely closing to new business with consequential reduction in new business; and

- The protection offered by reinsurance.

4.13.6 The following are some common methods that an Appointed Actuary may consider for setting the level of PADs:

- The regulations provide for the need to value general insurance policy liabilities including PADs at 75% level of sufficiency. Where accident and health policies exhibit similar claims characteristics, this is a possible approach;

- The regulations prescribe the loadings for modified policy liabilities (MPL) and modified minimum condition liabilities (MMCL) for the participating policies. A

common practice is for the loadings for policy liabilities with PADs to be calculated with half of the prescribed loadings for MPL and MMCL. This approach attempts to balance the quantum of PADs and C1 risk requirement. In determining the PADs for participating policies, additional consideration for asset risk and asset liability mismatching risk may also have to be factored in as C1 only captures insurance risk.

The Appointed Actuary should be able to justify any approach adopted. The common practice may not be suitable for the company's portfolio and hence the Appointed Actuary should independently consider the required margins for each homogeneous group of policies in the company's portfolio.

Bearing in mind the relationship between the policy liabilities and C1 risk requirements, the results should provide a realistic portrayal of the company's policy liabilities and risk requirements.

5   Reporting

i.   The report should highlight any inadequacies of the actuarial investigation exercise.

ii.   An Appointed Actuary can suggest areas of improvement that should be looked into for the benefit of future reporting.

iii.   The report should highlight any significant changes in assumptions since the previous report was submitted to MAS. Where appropriate, the Appointed Actuary should give reasons for such changes and the follow-up actions taken up by the company.

5.1   Presentation

5.1.1   The content of the report must be in compliance with the related regulations, notices and guidelines issued by MAS. Any differences must have been specifically agreed in advance by MAS, and if so agreed, such agreement should be noted in the report.

5.2   Sign-Off

5.2.1   The report must contain a statement by the Appointed Actuary to certify that the valuation was completed in accordance with SAS SAP L02.