

INSTITUTE OF ACTUARIES OF INDIA (IAI)

Actuarial Practice Standard 10 (APS 10)	Determination of the Embedded Value (EV) of life insurance companies incorporated in India and Regulated by IRDA for the purpose of Initial Public Offering (IPO). This Practice Standard shall constitute Actuarial Practice Standard within the meaning of Annexure1, Section c (2) (xiv) of the IRDA(Issuance of Capital by Life Insurance Companies) Regulations, 2011 dated 14 th November, 2011
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Classification	<p>Practice Standard within the meaning of Principles and Procedures for issuance of Guidance Notes issues by IAI. Section 2.00 of Version 3.00 is reproduced for ease of reference;</p> <p>2 Classification of guidance notes</p> <p>2.1 Practice Standards</p> <p>A material breach of a guidance note classified as a Practice Standard would in itself be a ground for complaint under disciplinary powers and would amount to a strong prima facie evidence of unprofessional conduct or professionally objectionable conduct. Such evidence could normally be set aside only if the member could show that in an actuarial advice given any departure considered appropriate from the strict compliance with any aspect of the Guidance Note had been disclosed and justified.</p> <p>2.3 Recommended Practice</p> <p>A failure to comply with the Guidance Note classified as Recommended Practice would not be itself a ground for complaint under the disciplinary powers. However, the Disciplinary Committee investigating a complaint for unprofessional or professionally objectionable conduct would take into account any such failures. Such failures would be regarded as more serious if they have not been disclosed and justified in the report.</p>
Legislation or Authority	<ol style="list-style-type: none"> 1. Insurance Act, 1938 2. IRDA(Issuance of Capital by Life Insurance Companies) Regulations, 2011 dated 14th November, 2011, herein after referred to as IRDA Regulations
Author	Council of the Institute of Actuaries of India (IAI)

Application	Fellow members of IAI (referred to herein after as “Actuary”) reporting or reviewing the embedded value results of life insurance companies for the purpose of seeking listing on stock markets in India through an Initial Public Offering (IPO). It is understood that IRDA guidelines/circulars/regulations as applicable, together with this Practice Standard, will be complied with by the Actuary.
Compliance	All members of IAI are reminded that they must always comply with the Professional Conduct Standards (PCS) and that Actuarial Practice Standards and Guidance Notes impose additional requirements under specific circumstances.
Status	Adopted in Council meeting held on 08/12/2012
Version	1.00/08/12/2012
Effective	With immediate effect

1 Definitions

- 1.1** The Embedded Value (“EV”) is a measure of the consolidated value of shareholders’ interest in the life insurance business within the meaning of Insurance Act, 1938, and applicable IRDA Regulations. It represents the present value of shareholders’ interests in the earnings distributable from the assets allocated to the business after sufficient allowance for the aggregate risks in the business.
- 1.2** More detailed definitions are provided in Section 5.

2 Introduction

- 2.1** As provided under Section 6AA of the Insurance Act, 1938, the promoters of life insurance companies may wish to seek a stock market listing of these companies.
- 2.2** It is required by the IRDA Regulations as applicable in the context of IPOs that companies disclose their embedded value in order, at least, to demonstrate their compliance with applicable Eligibility Criteria.
- 2.3** IRDA Regulations require the Embedded Value Report to be prepared by “an Independent Actuarial Expert”, known hereafter as the Reporting Actuary, and to be “peer reviewed” by another “Independent Actuary”, known hereafter as the Reviewing Actuary. (Refer to Section 6(vii) of the IRDA Regulations). Actuaries will be called upon to determine or review the EV of life insurance companies for the purpose of seeking a stock market listing. Where an Actuary is called upon to determine or review the EV of a life insurance business as part of a larger entity (such as that of a Group including a life insurance company), this Practice Standard applies to the life insurance business component only.

- 2.4 Apart from the relevant statutory and regulatory provisions, there are a number of areas surrounding the valuation for an IPO that an Actuary needs to consider. This Practice Standard covers the following areas:
- Considerations affecting the appointment of an Actuary
 - Valuation method
 - Valuation assumptions
 - Report and disclosures
 - Working with other advisors
 - Other considerations
- 2.5 This Practice Standard uses several concepts and wording from the CFO Forum's European Embedded Value ("EEV") Principles and Guidance and Basis for Conclusions and the European Insurance CFO Forum Market Consistent Embedded Value Principles¹ ("the MCEV Principles") and related documents which are copyright of the CFO Forum. For the avoidance of doubt compliance with CFO Forum Principles is not required of the Actuary.
- 2.6 An EV calculated in compliance with this Practice Standard will be known as Indian Embedded Value (IEV). The Reporting Actuary may depart from this Practice Standard only where the effect is not considered material. The criteria for deciding on materiality must be disclosed and should be expressed as a percentage of the IEV disclosed. Different limits may apply to individual judgments of materiality and in aggregate in respect of all such judgments made. The criteria for deciding on materiality should be specified by the Board of the Company and disclosed in the report of the Actuary.

3 Considerations affecting the appointment of an Actuary

Relevant experience

- 3.1 Although a number of Actuaries may have a wide experience of such valuations of life insurance companies, for many other Actuaries, the experience of carrying out such a valuation for the purpose of IPO may be new.
- 3.2 Before accepting the role to act as either the Reviewing Actuary or the Reporting Actuary, the Actuary should consider if he / she has the relevant experience to carry out such a valuation. If the Reporting or Reviewing Actuary does not have the relevant knowledge and experience to prepare such a valuation, it is essential that the Actuary seek, on a formal and professional basis, the co-operation and guidance of an actuary who does. This latter need not be a Fellow member of the IAI, but must be a fellow member of a full member Association of the International Actuarial Association and his/her identity should be disclosed in a preface to the IEV Report or Peer Review Report, as the case may be.

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Conflict of interest

- 3.3 In the context of an IPO, it may be expected that the Board of Directors of a company and its advisers have a duty to act in the best interests of the potential investors. In this context, any Actuary who is also a director, must consider carefully whether the two roles conflict bearing in mind duties to policyholders as set out in Actuarial Practice Standard 1 (APS1) of the IAI.
- 3.4 The Actuary should also be mindful of any conflict of interest in his/her accepting the assignment as either the Reporting or Reviewing Actuary required under the IRDA Regulations for this purpose. The Actuary should clearly and explicitly state in the preface to his/her Report that he/she has considered carefully the possibility of conflict of interest and has concluded that conflict of interest does not exist. Some illustrative examples of situations which may result in possible conflicts include:
- if the Actuary owns shares/share options in the company to be listed; or
 - if the Actuary is associated with any other advisors (including investment bankers or underwriters to the IPO issue) and similar.

Independence

- 3.5 For an Actuary in a particular situation to describe the advice offered as 'independent', the Actuary must be free, and be seen to be free, of any influence which might affect and/or has the potential of affecting the advice or limit the Actuary's scope of advice.
- 3.6 In the context of an IPO, the term 'independent' may be described as, inter alia, independent of the parties involved in the transaction, including the life insurance company, its promoters, employees, its other advisors and the potential investors.
- 3.7 The Reporting and Reviewing Actuaries while signing off their Reports should sign off as Fellow members of the IAI and should disclose the nature of relationship with his or her firm; whether sole proprietor, Partner of a Partnership firm of Actuaries or an employee of a company, in case the firm is a company.

4 Data

- 4.1 The Actuary must consider the extent to which it is appropriate to carry out investigations to assess whether the data is sufficiently accurate and complete for the purpose for which it is being used. Considerations should include the importance of the data, the level of review or audit performed on the data and type of controls on the data. It would be normal to perform checks and validations on the data consistent with those performed on the data for the statutory valuation. The Actuary requires the data to be appropriately endorsed by an auditor. The advice should include an explanation or qualification if the member has any material reservations about the data.

4.2 The typical sources of data/information to be made available from the life insurance company to be valued include:

- Financial statements and internal management accounts
- Policy liabilities including bases and methodology
- Statutory solvency and economic capital (where available)
- Experience investigation reports
- Financial condition reports
- Business plan reports and capital management plans
- Product pricing and premium rates
- Policy administration and data including existing business and movement statistics
- Unit pricing and valuation methodology
- Asset mix and asset values
- Asset liability management studies
- Strategic (target) asset allocation
- Benefit illustrations
- Company's policy on managing policyholder reasonable expectations
- The bonus policy of the Company
- Principles and practices adopted towards policyholder bonuses
- Underwriting policies and standards
- Claims management processes and any arrangement with third parties etc.
- Reinsurance arrangements
- Taxation bases and additional information such as carry forward of losses

4.3 The Actuary should review the data / information obtained from multiple sources for consistency.

4.4 The Actuary may additionally consider other externally available sources of data on the life insurance company such as industry and analyst reports.

5 IEV definitions and valuation method

Introduction

5.1 Due to the long-term contractual nature of the life insurance business and the wide variety and complexity of products, the valuation of life insurance companies will usually require the use of a valuation method that involves the projection of future cash flows. Simpler techniques will usually only be appropriate for approximate valuations for minor lines of business or as a check on the results produced by other methods.

5.2 Embedded value techniques are an actuarial method of determining the value of a life insurance business. The IEV is a measure of the

consolidated value of shareholders' interest in the covered business. (See Section 5.5, below, for a definition.)

- 5.3 The EV Methodology ("EVM") described herein after is applied to the calculation and reporting of the IEV of the covered business.

Coverage

- 5.4 The business covered by the EVM should be clearly identified and disclosed.

- 5.5 The business covered by the EVM should, where material, cover all life insurance business as defined under applicable IRDA regulations and which would be disclosed in an Appointed Actuary Report on the date on which IEV is prepared. It should also include all (or the relevant proportion of) such life insurance business in any subsidiary (or joint venture). The business covered by the EVM covers only in-force business as at the date of the IEV. ('In-force' business means existing business, irrespective of its premium paying status, and includes lapsed business which still has the potential of getting revived). Such life insurance business is herein after called 'covered business'.

IEV definitions

- 5.6 The IEV represents the present value of shareholders' interests in the earnings distributable from assets allocated to the covered business after sufficient allowance for the aggregate risks in the covered business.

- 5.7 The IEV consists of the following components:

- The free surplus allocated to the covered business;
- The required capital identified to support the business; and
- The value of in-force covered business ("VIF").

- 5.8 The value of future new business is excluded from the IEV. Each of the components of the IEV is defined below.

- 5.9 The IEV should reflect the risks in the covered business. For example, interactions should be considered between explicit allowances for financial options and guarantees, the prudence of the liability valuation, the level and cost of required capital and the risk discount rate. Their combined impact should, inter alia, be sufficient to allow for both financial options and guarantees and the cost of holding required capital to support any mismatching of assets and liabilities.

- 5.10 The Value of New Business ("VNB") is also a key component of the IEV results. It is the additional value to shareholders created through the activity of writing new business and is defined further below.

Free surplus

- 5.11 The free surplus is the market value of any assets allocated to, but not required to support, the in-force business at the valuation date.
- 5.12 It is determined as the market value of any excess of all assets attributed to the business but not backing liabilities over the required capital to support the covered business.

Required capital

- 5.13 Required capital is the amount of assets, attributed to the covered business over and above that required to back liabilities for covered business, whose distribution to shareholders is restricted.
- 5.14 The level of required capital should meet at least the shareholders' portion of the level of solvency capital at which the regulator is empowered to take any action. It would also include any amount "encumbered" by regulatory restrictions that prevents its distribution or removal from supporting the covered business.
- 5.15 The required capital should include amounts required to meet internal objectives, for example internal objectives could be based on an internal risk assessment or that capital required to obtain a targeted credit rating. Where the required capital reflects internal objectives the approach used to determine the required capital should be disclosed.
- 5.16 The amount of required capital should be presented from a shareholders' perspective. Funding sources other than shareholder resources, for example subordinated debt or policyholder funds, should serve to reduce the required capital.

Adjusted net worth

- 5.17 The sum of the free surplus and required capital is the adjusted net worth. This is the value of all assets allocated to the covered business that are not required to back the liabilities of the covered business.

Value of in-force covered business ("VIF")

- 5.18 The VIF is the present value of future post taxation shareholder cash flows projected to emerge from the in-force covered business and the assets backing liabilities of the in-force covered business.
- 5.19 Liabilities of the in-force covered business would normally be dictated by local regulatory requirements. The required capital should be consistent with the definition of liabilities used.

- 5.20** The VIF includes the value of renewals of the in-force business and should be net of reinsurance accepted and ceded

The value of in-force covered business is to be calculated using a market consistent method as described in section 6. In a market consistent method, the approach to reflect the risks in the business is to calibrate the allowance for risk to match the market price for risk where reliably observable. The concept of mark to market is to value insurance liabilities, and therefore the shareholders' interest in the earnings distributable from assets allocated to the covered business, as if they are traded assets with equivalent cash flows. However, most insurance liabilities are illiquid and not traded. As assets are generally traded with an observable market price, asset cash flows that most closely resemble the insurance cash flows (from the shareholders' perspective) are used.

New business and renewals

- 5.21** New business is defined as covered business arising from the sale of new contracts (and certain increases to existing contracts) during the valuation period, including cash flows arising from the projected renewal of those new contracts. The valuation period is the year ending on the date at which the IEV is being reported. The value of new business includes the value of expected renewals on those new contracts and expected future contractual alterations to those new contracts. The IEV should only reflect in-force business, which excludes future new business. The reported value of new business should reflect only the additional value to shareholders created through the activity of writing new business during the valuation period and should reflect any effect of writing new business on the VIF and on the adjusted net worth.

- 5.22** The VIF should anticipate renewal of in-force business, including any foreseeable variations in the level of renewal premiums but excluding any value relating to future new business. New business should include recurring single premiums and changes to existing contracts and premium levels, provided these are not reflected as variations in in-force business in the calculation of the VIF (i.e. there should be no double counting). To distinguish between new business and existing business, the following are examples of indications that premium represents new business:

- A new contract has been signed
- Underwriting has been performed
- A new policy or new policyholder details have been entered on administration systems
- Incremental remuneration has become due to the distributor/salesperson
- Stamp duty is payable on the policy
- The pricing basis for the premium allows for the full cost of their

marketing and distribution.

- 5.23** The presence of renewal premiums in pricing assumptions is an example of evidence that renewals would be included in the value of new business. Renewals should include expected levels of:
- Contractual renewal of premiums in accordance with the policy conditions at the valuation date including any contractual variation in premiums
 - Non-contractual variations in premiums where these are reasonably foreseeable; for example, premiums expected to increase in line with salary or price inflation, or revivals of lapsed policies
 - Recurrent single premiums where the level of premium is pre-defined and reasonably foreseeable.
- 5.24** Any variation in premium on renewal of in-force business from that anticipated, including deviations in non-contractual increases, deviations in recurrent single premiums and re-pricing of premiums for in-force business, should be treated as an experience variance on in-force business and not as new business.
- 5.25** The projection assumptions used to value new business should be consistent with those used to value in force business.
- 5.26** The contribution from new business ideally would be valued using point of sale assumptions. However, this is not practical in all cases and notably non-economic assumptions tend to be updated less frequently than daily. However, where assumptions are not updated so frequently, the timing of the assumptions should be disclosed and the non-economic assumptions should be consistent with those employed to calculate the closing IEV.
- 5.27** The value of new business should be calculated as at the point of sale on a post-tax basis and using a consistent methodology with that used to determine the VIF. The value of new business may also be calculated at the end of the period, i.e. the valuation date, in which case the basis for accumulating it from the point of sale to the end of the reporting period should be disclosed.
- 5.28** The new business margins to be disclosed should be calculated as the ratio of the value of new business (VNB) to an appropriate measure of the new business premium volumes for the company as a whole. The measure of premium volume used to determine the margin should be defined and explicitly disclosed. Alternative calculations or sub-divisions by product group of the new business of new business margins may be disclosed as further information.
- 5.29** The Present Value of New Business Premium (PVNBP) should be disclosed for the company as a whole. For the avoidance of doubt, the PVNBP is the present value of the total premiums expected in respect of the new business written in the valuation period. The PVNBP should be calculated:

- By projecting the premiums expected in each future year, using assumptions and projection periods that are consistent with those used to calculate the VNB. The PVNBP may be calculated on a deterministic basis.
- Using premiums including reinsurance accepted, but excluding any deduction for reinsurance ceded, unless there are specific situations where this approach would be misleading.
- Using the same definition of new business as is used in the calculation of VNB and, where appropriate, other reported sales figures.
- By discounting the projected premiums using the discount rates used to determine the VIF. Where the premium projection period is longer than the period for which reliable reference rates are available, adjustments should be made that are consistent with the equivalent adjustments used in calculating the VNB.
- At the point of sale. This does not require assumptions to be at the point of sale; rather these should be treated consistently with the timing used in the VNB.

Participating business

- 5.30** For participating business the method must make assumptions about future bonus rates and the determination of profit allocation between policyholders and shareholders. These assumptions should be made on a basis consistent with the projection assumptions, established company practice and local market practice.
- 5.31** The IRDA regulations and the provisions of Insurance Act, 1938, that relate to participating (also called with-profit) business should be applied to projections of participating business.
- 5.32** Projected bonus rates should be consistent with the projected future investment returns used.
- 5.33** Where the company has an established bonus philosophy, whether explicit or defined by past practice, this should be applied to projections of participating business.
- 5.34** Where management has discretion over allocation of bonuses, including the realisation of unrealised gains, projection assumptions should have regard to the past application of discretion, past external communication, the influence of market practice regarding that discretion, any payout smoothing strategy in place and any regulatory guidance.
- 5.35** It is possible that some of the assets (residual assets) allocated to the participating business would remain at the end of the projection (after all bonuses have been allocated) as unallocated surplus. This surplus should not be negative. Acceptable valuation treatments are to assume that such

unallocated surplus would be distributed over time via final bonus to existing business, or as bonuses to both existing and future new business, and to value any shareholders' participation in its distribution at discounted value. All assets backing participating business should be assumed to be realised within the projection period.

- 5.36** Where investment income on assets backing required capital is subject to profit participation with policyholders, an appropriate adjustment may need to be made in the calculation of cost of required capital or frictional cost of capital, mentioned in Paragraph 6.9.

6 Determination of the VIF

- 6.1** The VIF will consist of the following components:

- Present value of future profits ("PVFP") from the in-force business (where profits are post taxation shareholder cash flows from the in-force business and the assets backing the associated liabilities)
- The time value of financial options and guarantees
- The frictional costs of required capital
- The cost of residual non-hedgeable risks,

each of which should be separately disclosed.

- 6.2** The PVFP should reflect the intrinsic value of financial options and guarantees.

Financial options and guarantees

- 6.3** Allowance must be made in the IEV for the potential impact on shareholder cash flows of all financial options and guarantees within the in-force covered business. This allowance must include the time value of financial options and guarantees and the allowance for the time value of financial options and guarantees must be based on stochastic techniques using methods and assumptions used in the underlying embedded value. All projected cash flows should be valued using economic assumptions such that they are valued in line with the price of similar cash flows that are traded in the capital markets.

- 6.4** The valuation of the financial options and guarantees should take as a starting point the actual asset mix at the valuation date.

- 6.5** Where management discretion exists, has passed through an appropriate approval process and would be applied in ways that affect the time value of financial options and guarantees, the impact of such management discretion may be anticipated in the allowance for financial options and guarantees but should allow for market and policyholders' reaction to such action. The management discretion should assume that the shareholders pay out all claims even if the assets of the company are exhausted. The application of such discretion must consider the environment arising in the

future projection which will likely be different for the current environment, but any changes from current decision rules (for example regarding flexible crediting rates or policyholder bonuses) must be supported by appropriate approvals.

- 6.6 Dynamic policyholder behaviour should, where material, be in the allowance for the time value of financial options and guarantees.
- 6.7 The value of financial options and guarantees should be deducted from the VIF.
- 6.8 The techniques used to calculate the allowance for the time value of financial options and guarantees should incorporate an allowance for stochastic variation in future economic conditions. The economic projection assumptions should be consistent with how the capital markets would value such cash flows and the economic projection assumptions guidance set out below.

Frictional costs of capital

- 6.9 An allowance should be made for the frictional costs of required capital for covered business. The allowance is independent of the allowance for non-hedgeable risks.
- 6.10 Frictional costs should be applied to the required capital.
- 6.11 Frictional costs should reflect the taxation and investment costs on the assets backing the required capital. The allowance for taxation should be based on the taxation rate(s) applicable to investment earnings on assets backing the required capital.
- 6.12 The required capital should be projected appropriately over the lifetime of the underlying risks. Approximate projection methods such as the use of key capital drivers to determine the run off pattern of the required capital may be used.

Cost of residual non-hedgeable risks

- 6.13 An allowance should be made for the cost of residual non-hedgeable risk not already allowed for in the time value of options and guarantees or the PVFP. This allowance should include the impact of: non-hedgeable non-financial risks and non-hedgeable financial risks. An appropriate method of determining the allowance for the cost of residual non-hedgeable risks should be applied and sufficient disclosures provided to enable a comparison to a cost of capital methodology.
- 6.14 The best estimate assumptions for non-hedgeable risks used in the calculation of the time value of options and guarantees and the PVFP should reflect the mean expectation of outcomes of that risk variable. The total IEV should allow for the mean impact of all non-hedgeable risks on shareholder value. The additional cost of residual non-hedgeable risks should therefore take account of any additional cost that arises due to the

difference between these two measures. This difference will result because of:

- Asymmetries in the impact of the risks on shareholder value; and
- Risks that are not allowed for in the time value of options and guarantees or the PVFP (e.g. operational risk).

6.15 An allowance for uncertainty in the best estimate of shareholder cash flows as a result of the non-hedgeable risks should be considered.

6.16 The cost of non-hedgeable financial risks should allow for any areas where the calibration of the model to the market does not fully mitigate the market risk. This may occur when market assumptions are required where there is no market or where the market is not sufficiently deep and liquid.

6.17 Regardless of the methodology used to determine the allowance for the cost of residual non-hedgeable risks, it should be presented as an equivalent average cost of capital charge. A single average charge should be calculated across all residual non-hedgeable risks, such that the present value of charges levied on the projected residual non-hedgeable risk based capital equates to the cost of residual non-hedgeable risks.

6.18 The residual non-hedgeable risk based capital should be determined using an internal economic capital model. The assessment of the economic capital can be performed using a variety of methods such as:

- The use of a model to project the distribution of profits and losses arising from the residual non-hedgeable risks; or
- The use of reasonable approximations such as an approach of aggregation of standard capital charges for each residual non-hedgeable risk based on appropriate shock scenarios.

The capital determined should be consistent with a 99.5% confidence level over a one year time horizon, to meet the associated risks. Allowance for management actions can be made where appropriate.

6.19 The residual non-hedgeable risk based capital should be projected appropriately over the lifetime of the underlying risks. Approximate projection methods such as the use of key capital drivers to determine the run off pattern of the residual non-hedgeable risk based capital may be used.

6.20 An allowance should be made for diversification in the cost of residual non-hedgeable risks and in determining the equivalent average charge on the cost of capital methodology:

- Diversification benefits within the non-hedgeable risks of the covered business should be allowed for provided the benefit is identifiable and quantifiable
- Diversification benefits between hedgeable and non-hedgeable risks of the covered business should not be allowed for
- Diversification benefits should not be allowed for between covered and non-covered business.

- 6.21** The allowance should reflect management's internal view of diversification benefits within portfolios of business and between portfolios and businesses at a group level, if appropriate.
- 6.22** The definition and method of determining the amount of the associated capital on which the residual non-hedgeable risk costs are applied should also be disclosed, along with the cost of capital in respect of residual non-hedgeable risks.

Economic assumptions

- 6.23** Economic assumptions must be internally consistent and should be determined such that projected cash flows are valued in line with the prices of similar cash flows that are traded on the capital market. No smoothing of market or account value balance values, unrealised gains or investment return is permitted.
- 6.24** Economic assumptions should be updated for each reported calculation of the IEV.

INFLATION

- 6.25** Where appropriate market instruments are available price inflation assumptions should be derived from them. In other markets, the price inflation assumption should be modelled considering a reasonable spread compared to the reference rates. For longer term assumptions, where observable market inflation data may not be available, approaches for setting the inflation assumption including analysing real interest rates in India and other markets and considering the long-term relationship (for example, over ten years or more) between Indian price inflation and nominal interest rates. Other types of inflation should be derived on a consistent basis.

SMOOTHING

- 6.26** Asset values on which to base calculations must be consistent with values observable in investment markets and not be smoothed. Unrealised gains should be allowed for in the projections used to determine the projected shareholder cash flows. For the avoidance of doubt, this does not preclude the projection of book values according to regulations in which case a portion of the unrealised gains are reflected in VIF rather than free surplus.

INVESTMENT RETURNS AND DISCOUNT RATES

- 6.27** VIF should be discounted using discount rates consistent with those that would be used to value such cash flows in the capital markets.

- 6.28** Where cash flows do not depend on, or vary linearly with market movements, an alternative method can be used which assumes that assets earn, before tax and investment management expenses, reference rates as in paragraph 6.30 and all the cash flows are discounted using reference rates which are gross of tax and investment management expenses.
- 6.29** Where cash flows contain financial options and guarantees such that they do not move linearly with market movements, asset cash flows can be projected and all cash flows discounted using risk-neutral stochastic models. Alternative approaches, for example using deflators, may also be used, subject to these approaches replicating prices determined using the reference rates and stochastic assumptions. In either method, the reference rates should be used as risk free rates.

REFERENCE RATES

- 6.30** The reference rate is a proxy for a risk free rate appropriate to the currency, term and liquidity of the liability cash flows.
- Where the liabilities are liquid the reference rate should, wherever possible, be set to a liquid risk-free yield curve appropriate to the currency of the cash flows. This could be either the government bond yield curve or the swap yield curve, subject to the underlying assets being liquid and providing a robust basis for producing reference rates.
 - Where the liabilities are not liquid the reference rate should be the reference rate yield curve with the inclusion of a liquidity premium, where appropriate.
- 6.31** In evaluating the appropriateness of the inclusion of a liquidity premium (where liabilities are not liquid) consideration may be given to regulatory restrictions, internal constraints or investment policies which may limit the ability of a company to access the liquidity premium.
- 6.32** Where the available financial market data used to set the reference rate is shorter than the projected liability cash flows, the data should be extended using an appropriate methodology, for example:
- Assuming that either spot or forward rates remain level at the longest available term; or
 - If there exists a relevant government bond yield curve which is longer than the financial market data used to set the reference rate, this could be used to extend the data by maintaining a constant margin from the end of the available data and assuming it remains level thereafter.
- 6.33** Where the financial market data used to set the reference rate is not available at all durations between the longest and shortest, the intermediate data points can be calculated by interpolation using an

appropriate methodology. If the financial market data used to set the reference rate is not available at the very short end, other appropriate market information should be used instead.

- 6.34** Where a company invests in fixed-income assets which have a yield different to the reference rates, the company should make appropriate adjustments to the projected asset cash flows to ensure that the asset cash flows, discounted at the reference rates, equal the market value of the assets.
- 6.35** Where companies have businesses in territories and or currencies where swap or government bond curves do not exist or do not provide a robust basis for producing reference rates then a more appropriate alternative may be used.

STOCHASTIC MODELS

- 6.36** Stochastic models and the associated parameters should be appropriate for the business being valued, internally consistent and, where appropriate, based on the most recent market data. Volatility assumptions should, wherever possible, be based on those implied from derivative prices rather than the historical observed volatilities of the underlying instruments.
- 6.37** Stochastic models should cover all material asset classes.
- 6.38** The calibration of the model should be based on market values such as equity option implied volatilities, swaption implied volatilities and the initial swap rate curve for market-traded contracts that are as similar as possible in nature to the option and guarantees contained within the liabilities. The model should reproduce these values to a high degree of accuracy.
- 6.39** Volatility assumptions should be based on the most recently available information as at the valuation date. Where market data is not available or there are concerns over the depth or liquidity of the market or if the market displayed unusual characteristics as at the valuation date then less recently observed measures and expert opinion should be considered. Alternative approaches for setting volatility assumptions where market data is not available include using the available market data from other markets, adjusted to the Indian market, and considering historical volatility adjusted to be consistent with implied volatilities.
- 6.40** The duration to maturity and the “moneyness” effect on the market implied volatilities should be taken into account where material and practical.
- 6.41** Correlations of asset returns and yields should be based on an analysis of data covering a sufficient number of years which is considered to be relevant for setting current expectations. The methodology used to derive the correlations should not normally change from year to year. Companies should, where possible, check the reasonableness of their correlations against externally available correlations.

6.42 Closed form solutions can be used where such methods are sufficiently accurate.

7 Non-economic projection assumptions

7.1 The assessment of appropriate assumptions for future experience should have regard to past, current and expected future experience and to any other relevant data. The assumptions should be best estimate (without any margins) and entity specific rather than being based on the assumptions a market participant would use. Changes in future experience should be allowed for in the VIF where sufficient evidence exists.

7.2 When setting assumptions for use in the projection of cash flows, the Actuary should consider the historical experience of the insurance company, adjusted to reflect known material changes in the environment and identifiable trends up to the valuation date, to the extent such information is available. Reference may be drawn from Section 4.2 in this regard.

7.3 When experience of the insurance company is unavailable, or is insufficient to provide a credible basis on which to develop assumptions, for example in the case of such life insurance companies that have not yet reached a stable state, the Actuary should consider other information sources in setting assumptions, such as the industry experience, wherever relevant.

7.4 If there is little credible information available either from within the insurance company or from external sources in developing the projection assumption, the Actuary should consider using his judgement regarding expected future experience in setting the assumptions.

7.5 Best estimate assumptions should be internally consistent. They should, where appropriate, be based on the covered business being part of a going concern.

7.6 Projection assumptions should be considered separately for each product group.

Expenses and commission

7.7 Future expenses such as renewal and other maintenance expenses should reflect all the expected ongoing expense levels required to manage the in-force business. The expense assumptions should consider, for example, the following:

- Continuing investment necessary, especially in systems, to maintain productivity levels and ensure service levels meet customer expectations in line with assumed persistency and renewal levels.
- Expense inflation consistent with the types of expenditure (such as office space, different types of staff, I.T. systems).

- 7.8 Favourable changes in unit acquisition and maintenance costs such as productivity gains should not be included beyond what has been achieved by the end of the valuation period. Therefore, the unit cost assumptions should reflect the actual expense experience in the period prior to the valuation. In deriving projected unit costs in respect of overheads, no allowance may be made for any growth in the book of business that may be assumed in the business plan. The VIF and VNB should be calculated using this basis although sensitivities to alternative unit cost assumptions may be included as additional disclosures.
- 7.9 The nature and impact on shareholder value of any exceptional development and one-off costs excluded from the unit cost base should be separately considered and disclosed.
- 7.10 The nature of development expenditure should be considered when deciding whether development cost should be included in the expense assumptions. To the extent that development expenditure is recurring in nature and arises to maintain the in-force book of business or acquire new business during the period and allow administration within the existing cost base this should be reflected in the expense assumptions. Some development expenditures are to enable future new business and therefore their inclusion in the current year costs should be considered. Development expenditure may also be to improve systems and processes such that future savings are expected as a result. In this case consideration should be given to whether it is appropriate or not to reflect the development expenditure in the assumptions given that the savings cannot be anticipated until they are evidenced.
- 7.11 Overheads should be allocated between new, in-force business and development projects in an appropriate way, consistent with past allocation, current business plans and future expectations. Similarly operating expenses should be allocated in an appropriate way.

Persistency rates

- 7.12 Appropriate allowance should be made in the value of in-force business for persistency rates (e.g. premium persistency, lapse and surrender rates, partial withdrawals, policy revivals and renewals) based on past evidence and expected future experience consistent with the assessment of other projection assumptions, the features of the existing products (including any lock-in periods and surrender penalties) and any known changes in the product mix and operating environment.
- 7.13 Where the business has material levels of options and guarantees dynamic policyholder behaviour should be considered in the allowance for the time value of those financial options and guarantees.
- 7.14 Where there have been significant changes in the operating environment such that historical experience may not be a useful guide for future persistency experience, the Actuary should consider using his/her judgement in setting the persistency assumptions including considering

knowledge of wider industry experience, the features of the products and the expected effect of the change in the operating environment.

Mortality and Morbidity rates

- 7.15 Appropriate allowance should be made in the value of in-force business for mortality and morbidity rates based on past evidence and expected future experience consistent with the assessment of other projection assumptions. The Actuary should consider potential changes in these rates, and should use his or her judgement in deciding on assumptions of future improvement or deterioration.

Valuation bases

- 7.16 The projected valuation basis should be compliant with regulation and professional guidance applicable to statutory valuations.

Taxation and legislation

- 7.17 The valuation must allow for all taxes and regulations, which would affect the cash flows prior to distribution to shareholders, in the relevant jurisdiction affecting the business. These should follow the local treatment and be based on best estimate assumptions, applying current legislation and practice together with known future changes.
- 7.18 Tax rates should consider the cash flows and tax position of the company.
- 7.19 Where appropriate, the Actuary should discount deferred tax assets and liabilities on the balance sheet relating to the business. In allowing for these assets and liabilities, the Actuary should consider the projected tax position of the business.
- 7.20 The IEV and VNB need not allow for any expected taxes incurred in the hands of the shareholders or as a consequence of distributions to shareholders given the potential need to make assumptions about the tax status of the shareholder to value taxes payable by the shareholder. The approach adopted to any such taxes should be disclosed.
- 7.21 Where there is significant uncertainty in the tax legislation and tax position of the company, this should be disclosed and, where appropriate, sensitivities provided and the value attributed to any carried forward tax losses should be disclosed.

Sensitivities

- 7.22 As required under the IRDA Regulations, the Actuary should also illustrate the impact different assumptions have on the IEV and VNB of the insurance company through different sensitivities or scenarios. This is particularly important if there is limited information based on which the Actuary has developed the projection assumptions. Refer to Appendix C for details of the minimum required sensitivities. The Actuary should also disclose additional sensitivities to other factors where these are deemed

plausible and have a significant effect on the valuation, or to assess the potential effect of expected changes in the operating environment (e.g. taxation or regulation).

8 Reports and disclosures

- 8.1** The Reporting Actuary should provide a formal written report to the Board of Directors summarising the work carried out and clearly stating the data used, methodology adopted, assumptions made, results of the valuation and his / her opinion.
- 8.2** The written report should enable the potential investors to see the extent to which the value could be sensitive to different assumptions when making a decision concerning the offer.
- 8.3** It is important that in his / her report, the Reporting Actuary give sufficient information to the potential investor to form a view on the 'vulnerabilities' to which the valuation is subject. The actuary should consider and disclose if there are certain assumptions which, if varied, lead to significantly different results. The Actuary should ensure that any material limitations are adequately disclosed.
- 8.4** In requirement of paragraph 3.7, above, the Reporting Actuary must ensure that he / she can be identified as the source of the advice and any qualifications, and where a third party is involved, that the advice is not presented in a way which is misleading. The report should identify the capacity in which the Actuary has prepared the report.
- 8.5** The Reporting Actuary may provide advice to his / her client on a range of subjects and using alternative assumptions on a confidential basis, but not intended for wider disclosure as part of the IPO. However, in so doing, the Actuary should not compromise his or her independence.
- 8.6** The formal report including the Reporting Actuary's opinion will need to be included in the offer document, under Annexure 1, Requirements for Applicant Life Insurance Company, to the Disclosure Regulations. This report may be a summary of a fuller report produced for the Board of Directors. The contents will be influenced by the circumstances of the case. The following are, however, some of the matters which the Reporting Actuary should, where appropriate, cover in the report to be included in the Prospectus, where its main or sole purpose concerns the determination of the components of economic value of the life insurance company for the purpose of an IPO. It is important to recognize that the following list is indicative and not exhaustive. Hence the Actuary should add any items which he /she feels are relevant for the prospective investors:
 - The name of the party instructing the Actuary
 - The terms of reference
 - A statement confirming that provisions of this Actuarial Practice Standard 10 have been adhered to. Discussions of the reasons, if the

Actuary has not adhered to any of the provisions contained in this Actuarial Practice Standard 10

- The date of valuation of the IEV and VNB of the life insurer
- A statement of the data used including any data reliances and limitations
- A statement that the valuation has been made assuming a continuation of current management and in a manner consistent with the operating record of that management (or otherwise if this is not the basis of valuation)
- Description of the methodology used in deriving the IEV and VNB of the company (see Appendix A for minimum disclosures on methodology)
- Description and results of an analysis of a change in the embedded value over at least one year prior to the valuation date (please see Appendix B for the minimum required constituent parts to be disclosed for the analysis of changes in the embedded value over one year)
- A statement of how the principal assumptions were determined for material lines of business covering, inter alia:
 - Mortality and morbidity rates;
 - Rates of policy termination and premium discontinuance (if applicable);
 - Commission and expense allowances;
 - Inflation rates;
 - Policyholder bonus rates and crediting rates (where applicable);
 - Allowance for reinsurance;
 - The market reference rates (for example rates at five year intervals). The methods used to extend the curves where a sufficiently deep market does not exist should be described. Similarly if short duration rates are based on other market information then this should also be disclosed. Where the reference rates are not based on the swap curves (as they do not exist or do not provide a robust basis) this should be disclosed with the alternative method used. If the reference rates include a liquidity premium then the liquidity premium should be disclosed along with, as appropriate, the method to derive the premium and the liability classes where allowance is made.
 - Implied equity and interest rate volatilities (if applicable)
 - A statement by the Actuary on the reasonableness of each of the assumptions

- Description of how policyholder bonus rates and crediting rates (where applicable) are determined and how the un-distributed assets (i.e. Estate) in the fund backing the participating business are treated in the valuation
- Description of the allowance made for significant financial options and guarantees
- A statement as to how taxation - including allowance for historical tax losses, if any; allowance for service tax assets and liability - have been allowed for in the valuation
- A statement as to how the need for and amount of solvency capital (or other higher level of capital, if maintained by the company), and the cost of such capital, has been allowed for in the valuation
- A statement of the resulting values showing, as appropriate, the separate constituent parts (please see Appendix B for the minimum required constituent parts to be disclosed for the components of economic value)
- A statement concerning key assumptions, variation in which would result in significant changes in the value
- A statement disclosing results of the sensitivity, scenario and stress testing carried out by the Actuary on the results (see Appendix C for minimum disclosures on sensitivities)
- A statement concerning the position where actuarial advice not related to the valuation, or guidance or opinions which were not strictly actuarial, was being given
- Any other information affecting the valuation of the company that, in the opinion of the Actuary, is important to be disclosed so that the potential investors can take an informed decision about their investment
- A statement covering the formal opinion by the independent external Actuary commenting on the reasonableness of the methodology adopted, assumptions used to determine the embedded value and value of one year's new business together with the accuracy of the results, given the methodology and assumptions adopted
- A statement of the Reliances and Limitations governing the work of the Actuary.

8.7 The Reviewing Actuary should provide a Review Report summarising the work carried out by him/her and his/her opinion.

8.8 The objective of the Review is to lead to an opinion by the Reviewing Actuary that the work of the Reporting Actuary complies with the requirements of this Practice Standard.

- 8.9** The Reviewing Actuary should cover all aspects of the work, including data collection and verification, selection of assumptions, selection of analytical method(s), calculations, results and conclusions. Nevertheless, the peer review is intended to be of high level, and so, for example the review of the calculations could be confined to reviewing the results for reasonableness rather than carrying out specific checks.
- 8.10** It is expected that differences if any, between the view-point of the Reporting Actuary and the Reviewing Actuary should be resolved before the Reporting Actuary makes his or her report final. However, to the extent that any material difference remains unresolved, it should be mentioned in the Review Report.

9 Working with other Advisors

- 9.1** It is common in an IPO process for Board of Directors to enlist multiple advisors including investment bankers and legal advisors in addition to actuarial advisors.
- 9.2** The responsibility for all documents issued to the potential investors rests with the Board of Directors. However, in the IPO process, typically the investment bank advisers take the overall responsibility for ensuring that the listing rules are observed. Legal advisers are also usually asked to verify the legal aspects governing the IPO.
- 9.3** As part of the IPO process each of these advisors may need to ensure, so far as possible, that the documentation submitted to the market regulator is accurate, complete and not misleading and that statements made by the Board of Directors are reasonable.
- 9.4** The Reporting Actuary should ensure that he / she has access to the other advisors and that there is a common understanding amongst the advisors on the IPO process.
- 9.5** The Board of Directors is entitled to rely on the advice of experts and to hold them responsible for it. The Reporting Actuary may, therefore, wish to retain his/her own legal advisers.
- 9.6** The Reporting Actuary should ensure that his / her advice and report is reflected appropriately in the other relevant documents to be submitted to the SEBI and for this purpose, should provide his / her comments to be incorporated in the same.

10 Other considerations

Forward looking projections

- 10.1** As stated in the Disclosure Guidelines, no value should be placed by the Reporting Actuary on the new business after the valuation date. For clarity, the following are not considered as 'new business' for this purpose:
- Renewal premiums under a regular premium policy in-force at the valuation date;

- Future increases in the premiums under a policy that are contractual in nature (e.g. index-linked increases).
- 10.2** Apart from the premium income arising as a result of voluntary purchase of new policies by potential customers, other examples of what should be considered as 'new business' for this purpose include voluntary increases in future premiums on existing policies (e.g. top-ups under unit-linked policies, increase in membership of a group policy etc.).
- 10.3** Typically, the listing rules of SEBI may also require companies not to make any forward looking projections.
- 10.4** While the work of the Actuary should reflect the requirements of SEBI, given the nature of life insurance business, it is reasonable to assume that any such requirement by SEBI does not preclude the Actuary from projecting the profitability of the business already in-force as at the valuation date or new business sold prior to the valuation date.

Appendix A

Minimum required disclosures for methodology adopted in valuation

- Clear description of covered business included in embedded value;
- For life insurance companies writing participating business the approach used to determine future bonuses and the treatment of any residual assets in the participating fund;
- A brief description of the statutory valuation basis used to determine the projected liabilities.
- A brief description of the treatment of products with reviewable rates and charges.
- Method used to determine the level of required capital adopted together with the required capital expressed as a percentage of the level of solvency capital at which the IRDA is empowered to take action. Where approximate methods have been used to project the required capital this should be disclosed together with a brief description of the basis of projection.
- Method used to determine value of new business including:
 - The definition of new business;
 - The basis of the new business calculation with regard to timing of assumptions and valuation;
 - Where there are material impacts on value related to interactions between new business and existing business, the basis for presenting impacts should be described.
- The published new business premium volume and whether it is consistent with the definition of new business. Where PVNBP values are disclosed, a description of how the underlying assumptions have been set should also be provided including details of where premiums before reinsurance have not been used. In addition, where PVNBP is being used to compare new

business volumes from one period to another, the following should be reported separately:

- The total amount of single premiums
- The total amount of annual premiums; and
- The average annual premium multiplier, being $(PVNBP - \text{total amount of single premiums}) / \text{total annualised amount of regular premiums}$
- Nature, amount and impact on embedded value of any exceptional development and one-off costs excluded from the unit costs adopted in projecting expenses, including a rationale for their exclusion;
- A comparison of actual expense levels (split between maintenance and acquisition) to the allowances in the IEV and VNB for the previous three years
- The approach used to allow for tax including the treatment and value of any tax loss balance as at the valuation date in the IEV and VNB.
- Nature of, and techniques used to value, financial options and guarantees including, where material, the management actions included in determining the time value of financial options and guarantees.
- The basis on which allowance has been made for frictional costs. The allowance for costs of investment expenses and taxation should be discussed. If any caps are applied to the costs incurred this should be disclosed.
- The method and basis on which allowance has been made for residual non-hedgeable risks. The risks allowed for should be described including the nature of the risk and whether the impact on shareholder value is symmetric or asymmetric. The non-hedgeable risks for which there is sufficient allowance in the time value of options and guarantees or the PVFP should be explicitly described. For the implied cost of capital charge, the definition and method of determining the amount of the associated capital on which the residual non-hedgeable risk costs are applied should also be disclosed, along with the cost of capital in respect of residual non-hedgeable risks.

Appendix B

Minimum required disclosures for assumptions adopted for the valuation

- How economic assumptions and other business assumptions (e.g. mortality, persistency, expenses and future asset allocation) are determined
- The market reference rates (for example rates at five year intervals). The methods used to extend the curves where a sufficiently deep market does not exist should be described. Similarly if short duration rates are based on other market information then this should also be disclosed. Where the reference rates are not based on the swap curves (as they do not exist or do not provide a robust basis) this should be disclosed with the alternative

method used. If the reference rates include a liquidity premium then the liquidity premium should be disclosed along with, as appropriate, the method to derive the premium and the liability classes where allowance is made.

- The methods used to derive volatilities and correlations should be disclosed.
- The expense inflation assumed
- Persistency assumptions by product group for material product groups and details of historical persistency experience over the previous three years

Appendix C

Minimum required disclosures for constituent parts of the components of economic value and the analysis of movement of embedded value

These are illustrative constituent parts only and should be considered as a 'minimum' disclosure requirement.

- **Embedded value**
 - Adjusted net worth split between free surplus and required capital
 - Value of in-force business split into its components
- **Value of one year's new business**
 - Value of one year's new business before and after cost of capital (if applicable)
- **Analysis of movement of embedded value over at least the last year in the format set out below**

	Free Surplus	Required Capital (RC)	Value of In-Force (VIF)	Embedded Value
Opening EV				
Opening Adjustments				
Adjusted opening EV				
Value added by new business during the period				
Expected return on existing business				
Transfers from VIF and RC to Free Surplus				
Variance in operating experience split by major components including mortality / morbidity, policy persistency, etc.				

Change in operating assumptions				
Other operating variance				
EV operating earnings				
Economic variances				
Other non operating variances				
Total EV earnings				
Capital contributions / dividend payouts				
Closing adjustments				
Closing EV				

The disclosure should include an explanation of each step of the analysis of movement.

- A reconciliation of the adjusted net worth to the balance sheet as per the financial statements

Appendix D

Minimum required disclosures for sensitivities performed on IEV

Sensitivity analysis should be provided for the embedded value disclosed with the impact considered on shareholder net worth and value of in-force.

The sensitivities should also be provided for the value of one year's new business values except where a particular sensitivity is not meaningful for this.

The following minimum sensitivities should be disclosed for the IEV and VNB:

Risk Discount Rate (if applicable)

- 200 basis points per annum increase and decrease

Interest Rates and Assets

- 100 basis points per annum change in interest rates both upwards and downwards;
- 200 basis points per annum change in interest rates both upwards and downwards;
- 10% decrease in equity values;
- 20% decrease in equity values;
- 25% increase in implied swaption volatilities (where relevant)
- 25% increase in implied equity volatilities (where relevant)

Expenses and Policy / Premium discontinuance rates

- 10% increase and decrease in maintenance expenses
- 10% increase and decrease in acquisition expenses
- 10% proportionate increase / decrease in policy / premium discontinuance rates (multiplicative i.e. base lapse rates of 5% would become 4.5% under the lower policy lapse rate sensitivity)
- 50% proportionate increase / decrease in policy / premium discontinuance rates (multiplicative i.e. base lapse rates of 5% would become 2.5% under the lower policy lapse rate sensitivity)
- Mass lapsation of 25% of policies at the end of any surrender penalty period for unit-linked insurance plan business
- Mass lapsation of 50% of policies at the end of any surrender penalty period for unit-linked insurance plan business
- A 50% proportionate increase / decrease in policy / premium discontinuance / partial withdrawal rates for the period after the end of any surrender penalty period
- 5% absolute increase / decrease in non-zero lapse rates

Insurance risk

- 5% proportionate increase / decrease in base mortality and morbidity rates

Required Capital

- Required capital set equal to the level of solvency capital where the base embedded value uses a required capital other than the solvency capital

Taxation

- If the tax rates applied to profits attributable to shareholders in the base results are different to the corporate tax rate for other industries, setting the tax rate in the IEV and VNB to be equal to the corporate tax rate for other industries.
- The effect on any deferred tax asset of the above sensitivities of the VNB should be disclosed.

In addition to the minimum sensitivities the Actuary should disclose plausible sensitivities to any other factors that would have a material effect on the IEV and VNB or where there are expected changes in the operating environment that would affect the IEV and VNB.

END