

Institute of Actuaries of India

Actuarial Practice Standard 7 (APS 7)	Appointed Actuary (AA) and Principles for determining Margins for Adverse Deviation (MAD) in Life Insurance liabilities
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Classification	Recommended Practice for statutory valuation due on and after 31 March 2008 and a Practice Standard for statutory valuation due on and after 31 03 2009.
Legislation or Authority	Insurance Regulatory and Development Authority (Assets, Liabilities and Solvency Margin of Insurers) Regulations, 2000 (“ALSM Regulations”) – Para 5(1) (b) of Schedule – II-A: Valuation of Liabilities – Life Insurers.
Other professional/regulatory guidance	<ol style="list-style-type: none"> 1. IRDA (Appointed Actuary) Regulations, 2000 (“AA Regulations”) 2. IAI Actuarial Practice Standard(APS 2): Additional Guidance for Appointed Actuaries and other Actuaries involved in Life Insurance 3. IAI Actuarial Practice Standard(APS 4): Peer Review and Appointed Actuary (AA) in Life Insurance
Author	Advisory Group on Life Insurance
Application	All Appointed Actuaries (AAs) of Life Insurers and Life Reinsurers and all members working as Peer Reviewers of such AAs, in connection with formal annual actuarial valuation (referred to as ‘Actuary’ generally in these APSs).
Compliance	<p>Members are reminded that they must always comply with the Professional Conduct Standards (PCS) and that APSs impose additional requirements under specific circumstances.</p> <p>While continuing with the status of APS 7 as Recommended Practice, members are reminded that, an Actuary is expected to comply with the provisions of APS 7 and any failure to comply should be adequately disclosed together with justification on the course of action in question.</p>

Status	Approved by the Council in its meeting held on 28 01 2008 under Due Process in accordance with the “Principles and Procedure for issue of Guidance Notes Version 2.00/25 08 2003”
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Version: 4.00 effective from 31 03 2008

Version: 4.01 effective from 01 07 2011

1. Introduction

- 1.1 Para 2 (4) of Schedule II-A of the ALSM Regulations requires the Appointed Actuary to include, while determining the amount of liability, an appropriate margin for adverse deviations (MAD). The Actuarial Practice Standard (APS 2): Additional Guidance for Appointed Actuaries and other Actuaries involved in Life Insurance, vide Para 2.1, requires the Appointed Actuary to determine MAD in compliance to requirements of the ALSM Regulations.
- 1.2 This APS is issued so that Appointed Actuaries are facilitated to determine MAD within a framework, which will be uniformly applied by all Appointed Actuaries, Peer Reviewers and other Actuaries.

2. Scope and Background

- 2.1 Appointed Actuaries are required to carry out and report on valuation of liabilities at least on an annual basis, in order to demonstrate solvency to Regulatory Authorities and to provide advice to the Board of Directors. These valuations are generally incorporated in published accounts and are reported in greater detail to the IRDA. Regulations prescribe the use of a gross premium valuation method using parameters considered by the Appointed Actuary to be appropriate. The Actuary is expected to incorporate margins in the best estimate assumptions, in order to incorporate a level of prudence. This Actuarial Practice Standard is intended to provide guidance on the determination of such margins – which are generally known as ‘Margins for Adverse Deviations’ (MAD).

3. Principles of and need for a Actuarial Practice Standard

- 3.1 The Actuary is required to exercise professional judgement in determining the appropriate level of MADs. The prime consideration must be the protection of the interests of existing policyholders, including the reasonable expectations of participating policyholders (‘PRE’). The Actuary must, therefore, consider the range of plausible future scenarios and ensure that the reserve is sufficient in all cases. The use of a low MAD may mean that the reserve will be insufficient to provide for policyholders in a quite plausible adverse scenario, which, if it were to lead to policyholder loss, would be professionally abhorrent. However, the use of

a high MAD, providing greater security of policyholder interests, also implies the tying up of greater amounts of capital. This may depress the policyholders' as well as the shareholders' returns. The Actuary must face the question of how much security is required and be conscious that there can be no absolute guarantee against all possible adverse outcomes. This Actuarial Practice Standard sets out the IAI's advice to the Appointed Actuaries, Peer Reviewers and other Actuaries concerning the issues that must be considered and the minimum margins that will generally be considered acceptable. The Appointed Actuary remains solely responsible for the levels of MADs in the same manner as for all other elements of the valuation bases.

4. First Considerations

4.1 The Actuary may first assess the best estimate assumptions and then add MADs.

MADs serve as a cushion against mis-estimation of the best estimate assumptions and against the deterioration or adverse movements in the same. This approach is to be preferred where 'best estimate' assumptions can be related to yields and prices available in open markets, or to other credible statistics.

4.2 Alternatively, the Actuary may seek first to establish net of MAD assumptions or provide an overall contingency reserve for adverse deviations using professional judgement. Whichever approach is taken, the Actuary must be prepared to quantify and justify the overall MADs used in the valuation as providing an appropriate level of prudence to enhance the degree of protection of policyholder benefits, from the impact of adverse experience. This should normally be done by running a series of projections to demonstrate the sufficiency of the reserve in various adverse scenarios. In such demonstrations, the Actuary may:

- (i) rely on the overall MADs rather than just the MAD that may have been associated with a particular parameter, but only to the extent that it can be held that the risk of coincident occurrence of adverse experience in several parameters is expected to have insignificant impact on the amount of the liability;
- (ii) have regard to the extent to which increases in liabilities may be offset by compensating increases in asset values;
- (iii) consider the ability of management to react to adverse experience, for instance by changing asset mix, reducing or eliminating bonuses (subject to maintenance of PRE), increase mortality and other charges where there is discretion to do so, or more extremely closing to new business with perhaps consequential reductions in expenses;
- (iv) consider the protection provided by reinsurance;
- (v) consider the additional protection provided by the actual solvency margin held, only in the most extreme adverse scenarios, which should generally be highlighted to the Board as ones, which would require either further capital injections or the closure of the business after securing the interests of policyholders. In such extreme scenarios, only 10% of the free assets, if

any, in the policyholders' participating fund can be assumed to provide the additional protection.

4.3 In constructing the adverse scenarios, the Actuary must:

- (i) identify and give particular attention to the conditions or combinations of condition that will be the greatest threat to the security of policyholder interests;
- (ii) identify and consider the extent, to which falling or rising interest rates may threaten the ability of the office to secure policyholder interests and where such risks cannot be substantially matched or mitigated;
- (iii) consider more generally the interaction of liabilities and assets;
- (iv) consider all options, with a view to policyholders acting rationally to maximize their own interests, particularly where this may be to the detriment of shareholders or other classes of policyholders. For instance, if in an adverse scenario, interest rates fall below the levels underlying guaranteed annuity rate options, then while selecting the adverse scenarios, the Actuary must allow for the risk that a large proportion (commensurate with the actual experience of the company) of policyholders may exercise their options and then decide whether to provide for the additional reserve or not;
- (v) avoid being influenced unduly, by personal opinion held *apriori* concerning the future (of say mortality experience or interest rates), and ensure consideration of a full range of plausible adverse scenarios.

5. Relevance of Experience

5.1 While setting MADs, the Actuary should consider the past experience of the company concerned.

5.2 While assessing the risks inherent in guarantees provided on long duration contracts and concerning the terms on which future premiums may be invested and investment income reinvested, the Actuary must consider the relevant experience available from jurisdictions other than India. This should include consideration of both deflationary and inflationary scenarios.

6. Mortality / Morbidity and Investment Guarantees

6.1 In considering the risks inherent in having provided mortality (and morbidity) guarantees, the Actuary must consider both the risks of deteriorating experience (for example on assurances) and of improving experience (for example on annuities). The risks of anti-selection should be considered in respect of the exercise of options to increase and / or renew cover. Similarly, the effect of selective withdrawals on the mortality experience should also be considered. For annuities, the Actuary should be able to demonstrate that the MADs are sufficient in improving mortality scenarios. The Actuary should be prepared demonstrate

that the overall MADs appropriately allow for the risk of growth of HIV/AIDS, applicable for assurances.

6.2 The Actuary must carefully consider all implicit and explicit investment guarantees provided, and the MADs should appropriately allow for the risk of such guarantees biting under adverse scenarios.

7. Minimum Adverse Scenarios

Parameter	Minimum adverse scenarios	Issues
Interest rate	Immediate rise or fall, from the current best estimate assumption, of 10% of the current gross redemption yield on 10-year gilts for the next five years. Thereafter, a rise or fall of a further 10% of current yields, whichever is more adverse for the office	
Mortality rate	<u>For assurances:</u> experience is 10% worse than current best estimate assumptions. <u>For annuities and annuity options:</u> mortality is 10% better than the current best estimate assumptions and continues to improve at around 0.5% pa.	Allowance may be made for any flexibility to adjust mortality charges, subject to other considerations, such as constraints placed by competition. The type of business sold (e.g. individual / group; different types of groups etc.) may also need to be considered.
Morbidity rate	<u>For assurances:</u> experience is 10% worse than current best estimate assumptions.	Allowance may be made for any flexibility to adjust morbidity charges, subject to other considerations, such as constraints placed by competition. The type of business sold (e.g. individual / group; different types of groups etc.) may also need to be considered.

Withdrawals / Partial withdrawals / Lapses / Revivals (if relevant), / Renewals and the exercise of options	An increase or decrease (whichever is adverse to insurer) of 20% of the best estimate experience of the insurer or industry experience	20% MAD applies to each of the parameters individually. Both guaranteed and non-guaranteed payments should be allowed for having regard to PRE. If there is no experience available, the Appointed Actuary has to use his professional judgement while deciding the assumptions.
Expenses and expense inflation	Management expenses are 10% more than the best estimate assumptions and increase at a rate, which is consistent with the assumed interest rate on new money	Where there is an expense overrun above the formula expenses, regard may be given to projections of future maintenance expenses on a more prudent basis
Bonus rate	Bonus rates adjusted to the extent possible to allow for experience and the PRE.	It may be assumed that bonus rates can be set broadly in line with asset shares, but only where the Actuary can be satisfied that this is not contrary to PRE.

The scenarios specified above are the minimum scenarios that the Actuary must consider. However, if considered necessary in his professional judgement, the Actuary must adopt more adverse scenarios than those specified above, while setting the MADs.

"To illustrate, in certain circumstances, the minimum adverse scenario for withdrawals, partial withdrawals etc. may be considered as inadequate. For example, if the best estimate assumption for surrenders was 5% p.a. the prescribed minimum adverse scenario would be 4% or 6% p.a. depending on which produces the higher reserves. Given the lack of actual experience for surrenders, especially at the longer durations in force this is not a sufficiently strong adverse scenario, and a much higher MAD of, say, of 50% of best estimate would be more appropriate. (The figure 50 % is only illustrative and the Actuary is expected to exercise his judgment in arriving at the appropriate MAD)".

The Actuary must also apply the principles outlined above to the other parameters in the valuation bases, which are not specifically discussed above.

8. The overall objective of setting MADs should be to enhance the protection provided to policyholder benefits. The process spelt out is predicated on deterministic assumptions, including the margins for adverse deviations. Such a method will not provide a measure of confidence to the reserving process as can be had through use of stochastic techniques.

An aim should therefore be to move to the adoption of stochastic methods, develop the techniques required and come up with a desired level of provisioning adequate at any stated level of probability.

In periodic reviews of the APS7, the general readiness to bring in stochastic techniques for policy liability reserving will remain assessed to decide on a shift as such from continued use of deterministic assumptions.

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