PART I – OVERVIEW

1 BACKGROUND

1.1 BNM/RH/GL/003-17 on “Guidelines on Financial Condition Report” requires the Appointed Actuary to provide a comprehensive review of a licensed life insurer’s financial position in the form of a Financial Condition Report (FCR) to the Board of Directors (Board) of the insurer on an annual basis. The Guidelines provide a minimum standard for the Appointed Actuary to prepare the FCR on a comprehensive manner for presentation to the insurer’s Board. In addition to the evaluation of the current financial position of the insurer in respect of its immediate solvency position and capital adequacy, the report should also contain the Appointed Actuary’s assessment on the insurer’s continuing ability to remain solvent and sufficiently capitalised by assessing the possible future development. Appropriate financial projections should therefore, be made to ascertain the likely development of the insurer’s financial position over time.

1.2 In this regard, paragraph 29 of the Guidelines emphasises the importance of carrying out financial projections to complement the actuarial investigations, in particular the **dynamic solvency testing (DST)** technique to be utilised to carry out such projections to assess the future financial resilience of the insurer. The DST is a technique for projecting the financial position of a life insurer into the future, allowing for variations in the external economic environment as well as the experience of the insurer, in particular the mortality rates, investment return, persistency rates etc. that impact the insurer’s financial position. The DST assesses the position of the insurer at future points in time under various plausible scenarios. Based on the results of such projections, appropriate remedial actions may be taken to prevent any potential unfavourable developments. The DST is thus a valuable financial tool, which will enhance the financial management of the insurer.

2 COVERAGE

2.1 The purpose of these Guidelines is to outline a framework within which the Appointed Actuary is required to conduct a DST on the financial position of the insurer, taking into consideration the unique business features of each insurer. The Guidelines specify a minimum scope and standard for the Appointed Actuary in carrying out a DST, including the format for presentation of the results. However, in view of the subjectivity of some of the parameters, a significant amount of discretion has been left to the judgement of the Appointed Actuary. The Appointed Actuary is therefore expected to apply utmost due care and professionalism in exercising this judgement.

2.2 The Appointed Actuary shall conduct a DST on the financial position of the insurer at the end of each financial year. The DST will form part of the actuarial investigations required in the preparation of the FCR.

2.3 The general procedures to be followed by the Appointed Actuary in conducting a DST are set out in the paragraphs below.

PART II – MINIMUM STANDARDS

3 GENERAL PROCEDURES

3.1 The DST shall be a test of the expected **statutory solvency** of the insurer on an ongoing basis, where the statutory solvency is defined with reference to a comparison of admitted assets against the margin of solvency (incorporating the valuation liabilities). The test shall comprise a scenario using a set of assumptions representing the Appointed Actuary’s best estimate of future experience (thereafter is called base scenario) and a number of other scenarios designed to test the resilience of the insurer in the face of adverse circumstances.

3.2 The Appointed Actuary shall carry out the required projections on a deterministic basis. The Appointed Actuary may want to consider using a stochastic approach if he strongly views such approach to be preferable in assessing the company's future financial position. The DST shall involve projecting forward the insurer's life business revenue account, balance sheet and life fund statement of solvency under the base and other scenarios. The projection shall cover the insurer's total business, comprising all products and lines of business written. Separate additional projections for the insurer's participating and non-participating sub-funds shall also be carried out to study the individual development of the sub-funds. Given that the impact of the changing external economic environment as well as the company's internal experience may be different for annuity business vis-à-vis the other life business of the insurer, it is important for the Appointed Actuary to carry out separate projections specifically for the annuity business unless such annuity business does not form a significant part of the insurer's total business. If necessary, the Appointed Actuary may carry out separate additional projections by other major product lines with the sub-funds (e.g. for investment-linked business).

3.3 In conducting the DST, the life insurance fund's statutory solvency position at the end of the latest financial year as per the insurer's annual returns will form the basis for the projection. The projections shall use the same database as that used in carrying out the insurer's statutory valuation and bonus reserve valuation. However, it may not be necessary to adopt a seriatim approach in the DST. A suitable model office based on the available database can be constructed for the purpose of carrying out the DST. However, the Appointed Actuary shall carry out the necessary tests, including a goodness-of-fit test, to ensure that the constructed model office is appropriate and consistent with the insurer's business portfolio for the purposes of a DST. In arriving at the interest rate assumption for projecting the life fund, the Appointed Actuary shall take into consideration the present pattern and distribution of investments of the life insurance fund as well as the insurer's investment policy in respect of the various sub-funds maintained.

3.4 In carrying out the actual projections from year to year, the Appointed Actuary shall use the method of projection or approach, which he considers to be the most appropriate to the life insurer's portfolio of business for this purpose.

4 INVESTIGATION OF SCENARIOS

4.1 The DST investigation is an integral part of the FCR and shall be conducted in a consistent manner in relation to the other actuarial investigations in the FCR. In particular, the Appointed Actuary shall take into consideration the nature of the insurer's business, results of experience analyses carried out, investments of the life insurance fund, the statutory solvency position of the insurer, any bonus maintenance issues, the insurer's reinsurance practices, surplus distribution policy and also other issues that are pertinent to the projections under the DST. In addition, the Appointed Actuary shall also bear in mind the insurer's current business plan, particularly its plans for future growth in new business as well as any planned or proposed change in management policies which may impact the insurer's future financial position in order to make the DST projections as realistic and relevant as possible.

4.2 It is important to ensure the set of assumptions used in a particular projection scenario is consistent internally. A DST projection based on assumptions which are inconsistent with each other will not produce meaningful financial results as the resulting testing scenario will not be relevant in the context of the insurer's external economic environment nor its internal experience. For example, an investigation into a recessionary scenario with low investment return projections should also assume appropriately low inflation rates and correspondingly low new business volumes.

4.3 The first step in carrying out the DST would be to project the financial position of the insurer under the base scenario. In determining the base scenario, great care must be exercised by the Appointed Actuary to ensure that assumptions are on best estimate basis as defined in BNM/RH/GL/003-15: Guidelines on Bonus Reserve Valuation (BRV) with prudential margins including realistic assumption in new business growth and product mix. This will be followed by additional tests with changes in important assumptions to analyse the sensitivity of the insurer's future financial position to those particular assumptions. The Appointed Actuary shall vary these assumptions individually in the manner of a sensitivity test. However, the combined effect of a change in two or more related assumptions in a coherent manner may be more relevant and meaningful than an isolated change in any one of the individual assumptions.

5 ASSUMPTIONS

5.1 In conducting a DST, one of the most important assumptions is the future investment return. Studies have indicated that medium to long-term investment performance is one of the most significant determinants of the financial health of a life insurer. As the statutory valuation basis prescribed under the Insurance Act 1996 is based on a net premium valuation methodology with a fixed valuation interest rate, any change in the life insurer's investment performance and the external investment environment may have a profound effect on the financial position of the insurer. As such, it is extremely important for the Appointed Actuary to determine the investment return assumption and its variations for the DST with adequate care and conservatism. For this purpose, the Appointed Actuary shall consider the effect of at least the following interest rate scenarios:-

	Scenario	**Interest rate assumption**
(i)	Base Scenario:	Rate of interest being the best estimate of future experience of the company's specific life fund which shall not exceed the maximum gross interest rates requirement for computing BRV. It could be a current average yield on the specific life fund based on current experience and expectation of future investment conditions. Should the interest rate estimated exceeds that of the BRV, the Appointed Actuary is required to discuss the assumption with the Board to justify for its use under the Base Scenario. In addition,

Scenario	Interest rate assumption
	the Appointed Actuary is required to provide the justification in the FCR.
(ii) Pessimistic Scenario:	The yield used for this scenario is the lower of the interest rates:- (a) based on Base Scenario decreasing by half percent per annum over next five years and then level. However, if the resultant interest rate falls below 4% during the projection period, the Appointed Actuary may assume that the rate levels at 4%; and (b) which would result in a plausible adverse scenario of 95% confidence level as explained in paragraph 15. The lower interest rate is that which results in lower surplus at the end of the projection period.
(iii) Average Scenario :	Projections based on actual average experience over last three years.

In addition to the above scenarios, the Appointed Actuary may consider other scenarios if deemed necessary, including an optimistic scenario whereby the yield used is that of the base scenario increasing by half percent per annum over next five years and then level.

5.2 The base scenario shall be conducted using the Appointed Actuary's best estimate of future experience with prudential margins. In setting the assumptions, the Appointed Actuary shall comment on how the assumptions are adopted as compared with the actual experience. Where the assumptions differ significantly from experience, the Appointed Actuary shall provide the justification for the difference.

5.3 In addition to the investment return assumption, the Appointed Actuary in using his professional judgement, shall also test the variations in the following assumptions when carrying out the DST: -

(i) mortality rates and morbidity rates, including incidence of disability and diagnosis of dread disease;
(ii) withdrawal rates;
(iii) levels of new business; and
(iv) mix of new business.

In this regard, the Appointed Actuary is required to test a plausible adverse scenario, which in his judgement may occur only with a probability of 5%, i.e. a scenario which gives a 95% confidence level for solvency purposes. This test would indicate the solvency buffer or capital required by the company to meet such an adverse scenario. The percentage level specified is not intended to be precise but instead is an approximate benchmark for the Appointed Actuary to use in his professional judgement in order to simulate this scenario. In testing such a scenario, the Appointed Actuary would take into account interest rates, mortality rates, lapse rates, new business mix, and the effect of the company's asset portfolio in the projections. The Appointed Actuary may use his best judgment in setting the assumptions for this adverse scenario. For factors other than the interest rates and mortality rates such as the withdrawal rates, the Appointed Actuary may use the past three-year average for his assumptions. The results and comments of the Appointed Actuary on the required capital or solvency buffer required to meet the adverse scenario shall be indicated.

5.4 In addition, the Appointed Actuary should also consider variations in the following complementing assumptions, in relation to the experience of the past five years:-

(i) levels of expenses, including acquisition expenses;
(ii) inflation rates;
(iii) exercising of options by policy owners;
(iv) types of reinsurance arrangement and retention levels;
(v) bonus scales and distribution of surplus to shareholders; and
(vi) experience of riders.

The Appointed Actuary should comment on the results of the variation in the assumptions for each scenario tested. Such assumptions may be of particular importance and relevance for some insurers under certain specific circumstances.

5.5 It is important to review both the assumptions and the variations tested in a continuous manner for each financial year to ensure that the DST remains a relevant and meaningful financial management tool. A comparison of actual outcomes against past projections will be a good indicator of the continuing suitability of the elements in a DST.

6 TIMEFRAME OF PROJECTION

6.1 The projection should be for a period sufficient enough to ensure meaningful assessment of the impact of adverse trends in the various scenarios to be observed. For instance, for participating business, the timeframe shall be chosen in consideration of the bonus structures of the insurer’s products.

6.2 It is therefore recommended that the projection shall be carried out for a period of 10 years under the base scenario. Under this projection, the Appointed Actuary shall forecast new business levels for at least the next five years which will then level for the remaining years.

6.3 On the other hand, for alternative scenarios tested under the DST as provided under paragraphs 13 and 15 above, the Appointed Actuary should carry out the projection for at least the next five years, including for new business levels.

PART III - RESULTS

7 PRESENTATION OF RESULTS

7.1 The results of the projections shall be presented in the FCR as per the Summary Life Business Revenue Account, Balance Sheet and Summary Life Business Statement of Solvency format given in **Appendix**. Each summary should be accompanied by the list of assumptions used in the projections. The result of each DST scenario shall be shown separately.

7.2 The Appointed Actuary shall present the results of the investment return scenarios as required by paragraph 13 above. The FCR shall also report on the results of projections under the various scenarios conducted that have significant impact on the financial position of the insurer. In this regard, the Appointed Actuary should give a full projection (revenue account, balance sheet and statement of solvency) for the following scenarios and comment on their results:-

(i) Base scenario;

(ii) Pessimistic scenario;

(iii) Average scenario; and

(iv) Any scenarios which in the judgment of the Appointed Actuary deems it appropriate to highlight to Management and Board.

8 APPOINTED ACTUARY'S COMMENTS AND RECOMMENDATIONS

8.1 Based on the results of the DST, the Appointed Actuary shall provide a detailed analysis on the projected development of the insurer's statutory solvency over the next five years. The Appointed Actuary shall also comment on the general trend of the insurer's financial position, including the pattern of surplus emergence, over the remainder of the projection period. The Appointed Actuary shall draw the attention of the Board to any material, potential and imminent threats to the insurer's financial position over the timeframe of the DST projections.

8.2 The Appointed Actuary shall explain options open to the insurer to address any such threats for the Board's deliberation. From the available options discussed, the Appointed Actuary shall recommend, together with justification, the course(s) of action deemed to be most appropriate to deal with a particular concern.

9 IMPLEMENTATION DATE

9.1 The Guidelines shall take effect for all **FCRs for the financial year ending 31 October 2004 and onwards**.