**2007 S2**

**Q1** a) • Financial condition reports of the two former companies at 31 December 2006 to obtain the valuation data, assumptions, and methods used for all the types of business sold by the former companies. These would also contain general information on pricing, capital position, treatment of participating policies etc.

• The Scheme or other legal documents governing the merger of the two former companies and the merger of the statutory funds to establish the protection of participating policies and any other undertakings or guarantees agreed to protect particular policy types.

• Systems specifications for CLAS (the new system) and for each of the actuarial modelling systems used by the former companies. This should indicate any systems differences in the new model that might affect the modelling of the combined business.

• The Embedded Value or Appraisal Value reports of the two former companies and their experience investigations to provide an understanding of the inputs and outputs of the existing models of the former companies.

• Specifications of the data systems. This may be useful in identifying the data that is needed to be imported into the CLAS product and to ensure the data on the system is in a consistent format to what is required by CLAS.

1b) **Checks on data and systems**. Main steps are:

• Sample reasonableness data checks: For former companies, separately make sample checks that the valuation data (age, commencement date etc) is complete and reasonable.

• Data consistency check: E.g. Policies at end = Policies at start + new business – exits and similarly for premiums in force, funds under management etc.

• Often these checks would be done before 31 December on earlier data (eg 2006 data) to ensure any issues are resolved before the valuation date.

• Valuation on old models with old assumptions: Carry out the normal end of year calculations for each of the former companies separately at 31 December 2007 using the former actuarial models and policy data, and the 2006 assumptions. Carry out an analysis of profit to check the valuation results.

• Valuation on old models with new assumptions: Repeat the step above using the new assumptions appropriate for the combined business. Check for reasonableness against the results from the step above.

• Sample check a selection of model points using the new system.

• Check the results for new system vs former system for each of BEL, PVFPM, and PVFSB for each product. Investigate all material differences and make corrections as required.

• Carry out the full liability, capital and AV calculations the using new system and the new policy data for Combo Life.

• Comparing the old model result and new model result with old assumptions.

1c) Calculate future cashflow /determine the risk discount rate, calculate the BEL /determine the profit carrier

MoS Policy Liability Calculation. The main steps are:

• Set new projection assumptions. The profit carrier would not change from the previous year.

• Run the new projection models on the old assumptions to determine the impact of the current year experience variation

• Run the new projection models on the new assumptions to calculate the BEL.

• Calculate the new profit margin on the new assumptions.

• The Margin on Services Liability is calculated as the sum of the Best Estimate Liability and the present value of future profit margins, that is MoS\_Policy\_Liability = BEL + PVFPM

1d) Potential issues from the merger

• Choice of profit carrier. For a given RPG (related product group), hopefully the profit carriers of the two former companies were the same or similar, so no material change is required.

If the new profit carrier is different from either or both of the old profit carriers, then there may be a need to retain separate RPGs (because profit carriers cannot be changed once established).

• Identify loss recognition as an issue. The RPG may have been in loss recognition in either or both former companies and may be in loss recognition for the combined business.

If a previous loss is eliminated because of assumption change, it would be appropriate to recognise the reversal of the previous loss in year 2007. If the previous loss is eliminated by merger with profitable business, the loss reversal would be spread over future years.

• Given this is participating business, protection of policyholders’ reasonable expectations (PRE) by means of ring-fencing or bonus linking as set out in the Scheme documents amalgamating the statutory funds.

**Q2** a) According to Actuarial Standard 7.02 paragraph 5.2, Related Product Group is a grouping of products with:

• similar benefit characteristics and pricing structures

• may not cross subcategories

For retail risk insurance, we have all combinations of:

• Ordinary / superannuation (because of subcategories)

• Stepped premiums / level premiums (different pricing structure)

• Lump sum benefits / income benefits (different benefit characteristics) – could

also accept further subdivision into the risk types (ie death / TPD / trauma / DII)

2b) Most likely reasons of reduction (*time T* v.s *time T-1*) in PVFPM for lump sum RPG are:

• **Run-off of existing business**: The PVFPM for the existing business as at Dec 2006 is lower compared to Dec 2005 because the carrier runs off and profit is released for the year.

• It can also happen because PVFPM for new business written in 2006 is negative (or, if positive, not large enough to offset the reduction in the PVFPM for existing business). When combined with the PVFPM for the existing business, the combined value of PVFPM for the RPG is reduced.

• Shock lapses during 2006. For example, loss of a major distribution outlet and consequent re-writing of existing customers with another life insurance company. This eliminates the PVFPM from the lapsed policies.

2c) **Effect on Lump Sum MoS profit**:

• The PVFPM run-off of existing business does not have an impact on MoS profit as this was ‘expected’ in projections.

• A new business loss would result in a small reduction in MoS profit for 2006 because of the negative profit margins recognised in the part year exposure of the new business. A new business shortfall (compared to the run-off of existing business) would not impact MoS profit for 2006.

• The shock lapses will result in a reduction in MoS profit for 2006 because of the loss of the profit margins for the part year following the lapse of these policies. Shock lapses also result in a loss of PVFPM on the lapsed business, which can be large. This is akin to writing off the implicit DAC on the lapsed policies.

**Effect on Lump Sum AV:**

• The PVFPM run-off of existing business does not have an impact on AV as this was ‘expected’ in projections.

• A new business loss would result in a reduction in the Value of In-force because the PVFPM for the RPG is lower. The VNB may be substantially reduced depending on whether the cause of the new business loss is temporary. The impact of a new business shortfall (compared to the run-off of existing business) depends on whether the value of a single year’s new business is higher or lower than in the previous valuation.

• The shock lapses will result in a reduction in the VIF because of the loss of PVFPM. If the shock lapses are not one-off in nature then the BE lapse assumption would be increased resulting in further loss in AV but note that the BE assumptions were not changed as at 31 Dec 2006.

2d) Increase in PVFPM for DI RPG. Most likely causes are:

• The positive PVFPM occurs as a result of the assumption changes at the time of the 2006 valuation. This change has the result of reversing previous loss recognition (assuming PVFPM at 31/12/2005 was not exactly 0). (Note that a change in the investment earnings rate caused by a change in market interest rates would not lead to a change of BE assumptions).

• Note there was no material change of BE assumptions for the Lump Sum RPG so change must be related to DI specific factors – for example, most likely DI incidence and recovery rates and/or DI persistency assumptions or DI specific expense assumptions.

2e) **Effect on DI MoS profit:**

• The likely loss reversal will generate a MoS profit in 2006 equal to the loss reversal. The **change in DI claims assumptions will not otherwise affect 2006 MoS profit.**

**Effect on increase in DI AV:**

• The **change in assumptions will increase the VIF** and most likely also increase the VNB.

**Q3** a) ***Policy Liabilities components under the accumulation method***

Unearned premiums (UEP) / Claims reported but not admitted (RBNA) / Claims incurred but not yet reported (IBNR) / Disability income claims in course of payment (CICP) / Deferred Acquisition Cost (DAC) (but likely to be small for group business due to low initial costs) / Profit share accrued but not paid.

These liabilities should include claims expenses.

3b) ***Capital adequacy requirement***

Working through the CAR components:

In selecting the Capital Adequacy assumptions, the question suggests the qualitative factors in 4.3.2 of AS 3.04 are low / medium which means best estimate assumption loadings of at least 10% for mortality, 20% for TPD and salary continuance insurance (SCI) claims in payment, and 40% for SCI, as well as a loading for servicing expenses.

Offsetting factors are:

• The profit margins in the premium rates (about 5% last year)

• Margins for profit sharing in the premium rates

• Short term premium rate guarantees on average 18 months for an in-force portfolio.

The policy liability held for claims not paid and claims not reported will be based on best estimate assumptions with no margins. Hence, there must be an additional capital adequacy requirement for each of these. This applies also to SCI claims in payment.

The liabilities for unearned premiums may have a capital adequacy requirement depending on the relative sizes of the increased claims assumptions and the premium rate margins. There is likely to be a requirement for SCI at least because of the 40% assumption loading.

These increases to UEP, RBNA, IBNR and CICP will be offset by reductions in profit sharing liabilities.

The most material items are likely to be the products with the highest required margins (SCI, TPD) and the products with the highest claims reserves (SCI, TPD).

The end result is likely to be that the Capital Adequacy Liability is higher than the Current Termination Value which should be the same as the MoS policy liabilities.

Add other liabilities (no info in question)

Add Inadmissible Assets (no info in question)

Resilience Reserve – a resilience reserve is likely because the duration of the assets is short while the duration of the liabilities can be medium (unreported claims) or long (long term CICP).

Minimum of Solvency Requirement may apply if there is an Expense Reserve from AS 2.04.

New Business Reserve – no info in question but group risk business usually has low capital requirements overall so this may be nil.

Add Transitional Reserve (no info in question).

Therefore, in summary the most material items are likely to be the Capital Adequacy Liabilities for the SCI business (and TPD to a lesser extent) and the Resilience Reserve.

3c) Effect of new scheme

On best estimate assumption of nil profit this scheme lowers the average profitability of the portfolio which increases the CAL.

Considering 4.3.2 in AS 3.04 the new scheme reduces the reliable data, the reliability of past company experience and the stability of experience for the whole portfolio. Therefore the CA assumption margins should be higher. This will further increase the CAL.

The claims reporting delays are longer than the existing portfolio so the IBNR reserve will be higher and this will further increase the CAL. However, it should be noted that the effect of this assumption will only occur over time as IBNR is built up as the new scheme has had time to build up some exposure.

3d) Recommend consideration of the following matters to mitigate the risks for this contract:

1. Offering no more than a 12-month premium rate guarantee to limit the mispricing risk;

2. Obtaining reinsurance support on a substantial basis such as a 50% quota share to limit our risk exposure;

3. Special monitoring of the experience of this contract on a monthly basis because of its size and claims risk.

Summary of the profitability & capital requirement implications:

additional premium to cover risk / lower return on capital

**Q4** c) *Steps to reconcile two estimates of expenses for 2008*

To reconcile model expenses to accountants’ budget:

• Gain an understanding of the basis used by the accounting department to arrive at their expense estimates

• Check that the accountants’ budget is complete and includes all expense items allowed for in your model

• Check that both estimates are based on the same product mix and volumes of new business

• Check the percentage increase in each expense line (salaries, IT etc) in the accountants’ budget and compare this with the overall growth rate of the company

• Check for one-off expenses or savings in the model expenses or in the accountants’ budget

• Investigate and adjust any differences as appropriate until the two estimates are comparable.

**Q5** a) Adjustments to AV method

Value of capital locked-in

• The value of in-force and the value of new business are both based on the Statutory Reserves and do not allow for the costs of the additional 25% capital requirement.

• The cost arises because the capital earns the fund earnings rate while the earnings and release of this capital are discounted at the risk rate of 15%.

Growth of 10% in perpetuity

• This rate is lower than the growth achieved in the last five years but is unrealistic in perpetuity.

• If AP Life pays for this level of growth in perpetuity there is downside risk and not much upside.

• The growth rate of 10% pa is not consistent with the risk discount rate of 15%.

5b) Assumption adjustments

Note that assumptions relating to mortality or investment earnings are unlikely to change due to the change in ownership

• The assumption for tax may need to be adjusted for an overseas parent in the areas of withholding tax on dividends, imputation credits (if any).

• The expense assumptions need careful review in light of AP Life’s plans to run the company.

• There may be additional expenses arising from additional reporting requirements to Australia, eg adoption of MoS reporting.

• Expense savings may be achieved by sharing resources with the parent company or with other subsidiaries in the region.

• There may be expense savings if common systems can be implemented across a number of countries to achieve more scale benefits.

• There may be some back-room processing which can be managed in a lower-wage country.

• New business & lapse: May reflect the risk of distributor disenchantment on takeover effecting future sales and lapse assumptions (at least as a sensitivity)

5c) i. *Property assets more than the market value included in the accounts*

• Affects only the Net Worth calculation because the other components assume assets equal to the policy liabilities including capital margins

• Adjust the increase in the value of the properties and deduct tax on the unrealised gain

• Add the net increase to the Net Worth

ii. *Higher acquisition costs*

• Affects only the value of future new business because the other items are fixed at the valuation date

• Impact is to reduce the value of future new business

• If the new business written through the related company is separately modelled, then increase the acquisition costs in the new business model points for this business

• Otherwise recalculate the average acquisition costs for all new business

iii. *Loss of Agent*

• VNB & VIF: Direct effect on the value of new business but also an indirect effect on the value of in-force business

• For in-force business may need to allow for higher lapses/surrenders on business written by the departing agent

• For new business remove the new business volumes that were included from the departing agent

• Generally review the loss of the agent to see if the underlying cause could affect other agents

• Unit expense assumptions should be reviewed. Acquisition costs per unit would increase unless there is a corresponding reduction in sales support related costs. Long term maintenance costs may increase due to the lower in force volumes but relatively fixed expense base.

**Q6** a) *Most likely causes are:*

• Under AIFRS the discount rate for valuing insurance contract liabilities is a risk-free rate whereas previously the fund earnings rate was used. This change has the result of increasing the negative amount of the policy liabilities.

• Under AIFRS, changes in discount rates must flow directly through into the calculation of liabilities and not spread through the future profit margins, where previously the standards provided a choice of method. If the latter approach was previously used, this could impact the policy liabilities.

• Under AIFRS the deferral of acquisition costs for investment contracts has been narrowed to incremental costs directly attributable to securing the new business. For ML the salaries of sales staff may not meet the definition and so may not be deferred. This increases the liabilities for this business.

• Under AIFRS, the policy liability for investment contracts is grossed up for the tax on the reduction or removal of deferred acquisition costs and the tax on the DAC is shown explicitly as a tax liability.

• There is also now an effective surrender value floor to the value of the policy liabilities.

• Changes to the insurance contracts liability (from using the risk-free rate and flowing changes in discount rates directly to the policy liabilities as per above) will also impact the deferred tax liability;

6b) *Variability in reported profit:*

For the insurance business, the risk-free discount rate is reset each year and the present value of this change on future cash flows is reflected in the change in policy liabilities and hence the reported profit each year. Because the policy liabilities are negative it is not straightforward to match the liabilities with assets of a similar duration. The change in the risk discount rate each year can be a major source of profit variability for this business. (Note that even if policy liabilities are well matched, the effect of changes in investment asset values on the capital used to support the policy liabilities will still cause variability in the reported profit).

For the investment business, the restrictions on deferring acquisition costs will result in lower profits whenever the rate of growth of the business increases (to the extent that these “non-deferrable” acquisition costs increase to generate, or as a result of, this growth). The reverse is true if the rate of growth slows.

On balance the changes to AIFRS would seem likely to increase the variability in reported profits.

6c) *Reinsurance proposal:*

Reinsurance of a proportion of the existing term life business should have the effect of passing the capital requirement for this business to the reinsurer and so should strengthen the capital position of ML. The proposal should also reduce the profit variability in future. Other advantages include services such as the provision of underwriting manuals.

The disadvantages of reinsurance are the costs of reinsurance, mainly the expenses and profit margins of the reinsurer, as well as increases in administration and system costs.

Reinsurance proposals could be obtained and tested to determine whether the advantages outweigh the disadvantages.

The proposal to reinsure the investment business with a fund manager would not be permitted under the Life Insurance Act because the fund manager is not a registered life insurance company. But it would be possible to reinsure with a life reinsurance company and the considerations would then be similar to the reinsurance of the term life business.

6d) *Perspectives of parties:*

**Perspectives of the Appointed Actuary:**

• Want to ensure that the Directors make informed decisions and clearly understand the risks of the proposals.

• Want to ensure that a suitable level of target surplus is maintained above Capital Adequacy requirement to ensure that CAR is met consistently and policyholder interests are protected.

• Want to understand the profit impacts on the company to communicate to management and Directors.

**Perspectives of the Auditor:**

• Want to ensure a True and Fair view is provided to shareholders, regulators and the general public in the financial statements of ML. Concerned about how this arrangement would impact these statements

• Interested in the actuary’s recommendation on target surplus and in the decision on this by the Directors

• Want to ensure that ML’s risk management strategy has been followed

**Perspectives of the ML independent directors:**

• First priority to consider the financial security of the company and the security of customers. Will need to assess the extra security that may be provided by this arrangement.

• Also needs to consider the best interests of the shareholder (Megabank) and the impact of the arrangement on profit.

• Ultimately must assess the risks (in relation to risk tolerance) and make the decision on the proposals after considering the views of the interested parties and overall impacts.