FINAL

Life Insurance Capital Adequacy Test for Life Insurance Companies and Branches of Foreign Companies Carrying on Life Insurance Business in Jamaica

INSTRUCTIONS

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1. Definitions

1. **Life Insurance Capital Adequacy Test** or **LICAT** means a requirement that life insurers maintain at least a minimum level of capital and surplus that reflects the riskiness of their assets and operations

2. **Associate** – has the same meaning as that of 'associated person' set out in the Insurance Act, 2001.

3. **Back-to-back Placements** – are capital issues between 2 or more companies, whether directly or indirectly, which in the opinion of the FSC, inflate the capital position of the companies such as a case in which a company "A" holds shares in another company "B" and company "B" also holds shares in company "A"

4. **Bank Grade Obligations** – obligations of any deposit taking institution licensed under The Banking Services Act, 2014 which includes securities issued by, loans made to, or securities or loans guaranteed by, and accounts receivable from the deposit taking institution

5. **CISTP** – Investments made in collective investment schemes and other pooled arrangements recognized by the FSC for the purposes of calculating the LICAT

6. **Control (of an entity)** – The power to govern the financial and operating policies of an entity so as to obtain benefits from its activities.

7. **Corporate Agent** - An agent that is a corporation

8. **Duration** of an asset or a portfolio of assets is a measure of the sensitivity of the value of the asset or portfolio of assets to changes in interest rates

9. **Government Grade Obligations** – obligations of the Government of Jamaica and includes securities issued by, loans made to, securities or loans guaranteed by, and accounts receivable from the Government of Jamaica

10. **Investment Grade Reinsurer** - is a reinsurer with a long-term issuer credit rating that is not less than BBB (or equivalent)

11. **Not-Investment Grade Reinsurer** – is a reinsurer with a long-term issuer credit rating that is less than BBB (or equivalent) or a reinsurer for which a credit rating is not available

12. **Subsidiary** – An entity, including an unincorporated entity such as a partnership that is controlled by another entity (known as the parent)

13. **Surplus Allowance** - net of reinsurance risk adjustment for non-financial risk reported in the financial statements in respect of insurance contracts

2. Instructions

2.1. Minimum Capital Requirement

A life insurance company and branches of foreign companies carrying on life insurance business in Jamaica shall have a capital ratio greater than 100% (to be approved). Below this level the insurer or branch would not have met the required margin of solvency i.e. would be deemed to be insolvent.

The capital ratio is calculated as: $\frac{\text{Total Available Capital + Surplus Allowance}}{\text{Total Required Capital}}$

The attached schedule shall be used to file the LICAT with the FSC.

2.2. Capital Available

Total available capital is comprised of two tiers less deductions:

- Tier 1 (the core capital); and
- Tier 2 (supplementary capital)

2.2.1. Tier 1 Capital

Tier 1 shall consist of:

(a) Ordinary shareholder's equity, including ordinary shares and retained earnings adjusted to add contractual service margins that are reported as liabilities in the financial statements less contractual service margins that are reported as assets in the financial statements
(b) Qualifying non-cumulative irredeemable preference shares
(c) Participating accounts
(d) Non-participating accounts (mutual companies)
(e) Currency translation reserves
(f) Qualifying minority interests in subsidiaries arising on consolidation from the capital instruments listed in (a) to (f) above
(g) Investment reserves

Less the following, none of which must be less than zero

(a) Goodwill
(b) Other intangible assets
(c) Cash surrender value deficiencies calculated net of reinsurance on an aggregate basis within sets of policies by product type. Deficiencies are calculated relative to fulfilment cashflows (i.e. including the risk adjustment for non-financial risk) and are floored at zero.
(d) Total policy-by-policy negative reserve amount
(e) Back-to-back placements
(f) Investments by the insurer in its own treasury stock instruments whether held directly or indirectly and any of the insurer's own stock that the insurer is contractually obliged to purchase

(g) Future Income Tax Debits
(h) Unrealized gains and losses

Total policy-by-policy Negative Reserve Amount

Total policy-by-policy Negative Reserve Amount (TNRA) is

TNRA = Minimum (CSM, (1-T)x(NEG))

Where:

CSM = contractual service margin
NEG = total negative reserves calculated policy by policy on best estimate assumptions (i.e. excluding risk adjustment) and net of reinsurance. The net amount is subject to a minimum of zero.
T = corporate tax rate for life insurers in decimals

Policy-by-policy negative reserves should be calculated for all products and lines of business, including group and accident and sickness business, and future business assumed through reinsurance contracts issued. The calculation should include:

(a) the negative reserve for each certificate under group insurance policies for which premiums or reserves are based on individual insured characteristics, such as creditor insurance;
(b) the excess, if positive, of the deferred acquisition costs for any policy (including deferred acquisition costs for policies for which coverage has not yet become effective) over its termination or surrender charges; and
(c) negative group insurance refund provisions where recovery is not completely assured, calculated policy by policy.

2.2.2. Tier 2 Capital

Tier 2 shall consist of:

(a) Preference shares
(b) Subordinated debt
(c) Debentures and bonds
(d) Minority interest in other life insurance companies
(e) Total policy-by-policy negative reserve amount
(f) Cash surrender value deficiencies
(g) Unrealized investment reserves.

Tier 2A (hybrid capital) must have the following minimum characteristics:

(a) unsecured, subordinated to policyholder and creditor obligations and fully paid up;
(b) not redeemable at the initiative of the holder;
(c) may be redeemable by the issuer after an initial term of five years with the prior consent of the Commission;
(d) available to participate in losses without triggering a cessation of ongoing operations or the start of insolvency proceedings;
(e) allow interest or dividend payments to be deferred (as with cumulative preference shares) where the

profitability of the company would not support payment.

Tier 2B (instruments with limited lives) must have the following minimum characteristics:

(a) subordination to policyholders and senior creditors;
(b) the initial minimum term is greater than 5 years;
(c) may be redeemable by the issuer in the first five years or less, only with the prior consent of the Commission.

The following items qualify as Tier 2C capital:

(a) 50% of aggregate cash surrender value deficiencies
(b) 50% of total policy-by-policy negative reserve amount;
(c) unrealized net gains or losses.

The amount of capital elements, net of amortization, included in the Tier 2 capital may not exceed 100% of net Tier 1 capital.

Limited life instruments, net of amortization, included in Tier 2B shall not exceed a maximum of 50% of net Tier 1 capital.

The negative reserve amount included in Tier 2C must not exceed 33% of net Tier 1 capital.

2.2.3. Deductions from the sum of Tier 1 and Tier 2 capital

The following shall be deducted from the sum of Tier 1 and Tier 2 capital. No deduction can be less than zero.

(a) Substantial investments in non-life financial corporations that are controlled by the company
(b) Facilities that are treated as capital by unconsolidated non-life subsidiaries and by unconsolidated corporations in which the company has a substantial interest
(c) Investment in non-life Subsidiaries, Associates and Partnerships
(d) Assets in excess of prescribed limits or in breach of prescribed requirements
(e) Receivables and Recoverables from unregistered insurers or not- investment grade re-insurers
(f) Aggregate positive policy liabilities ceded under arrangements with unregistered insurers or not-investment grade re-insurers or associates
(g) total assets not included under the credit, market or pooled arrangement risk categories of asset risk (see 2.3.1(a) to (e)) that is in excess of 1% times (total assets of the insurer or branch less assets in Investment Funds associated with equity-linked business)
(h) Pension plans surplus that is reported as an asset on the insurer's balance sheet less pension surplus assets to which the insurer, in the opinion of the FSC, has unrestricted and unfettered access

2.3. Required Capital

Capital required for life insurance companies and branches of foreign companies carrying on life insurance business in Jamaica is the sum of capital required for the following three risk components minus contractually adjustable product credit and diversification credit.

(a) asset risk;
(b) insurance risk; and
(c) operational risk

2.3.1. Capital Required for Asset Risk

Capital required for asset risk is the sum of capital required for the following seven asset risk categories:

(a) Credit Risk;
(b) Market Risk for Ordinary Shares;
(c) Market Risk for Real Estate;
(d) Market Risk for Right-of-Use;
(e) Pooled Arrangement Risks;
(f) Foreign Currency Risks; and
(g) Interest Rate Risks;

Assets in Investment Funds associated with equity-linked business provided those assets are, to the satisfaction of the FSC, appropriately ring-fenced in such that legally they will only be available to equity-linked policyholders in the event of insolvency shall be excluded from the computation of capital required for asset risk.

2.3.1.1. Capital Required for Credit Risk

To determine capital required for credit risk for an asset item, multiply the applicable credit risk factor associated with the asset item by the balance sheet value of the asset item. The credit risk for an asset item shall not be less than zero. The total of these amounts represents the capital required for credit risk.

Insurers and branches must use the latest long-term rating assigned to the instrument or company by a widely recognized international credit rating agency or by any other credit rating agency recognized by the FSC. A credit rating translation matrix will be specified by the FSC.

An insurer and branch must consistently follow the ratings of one agency. Only where the agency does not rate a particular instrument or company, the rating of another agency which satisfies the requirement in the paragraph above may be used.

The credit risk factors to be applied to asset items are as follows:

0% Factor

a. cash;
b. Government Grade Obligations denominated only in Jamaican currency;
c. income tax receivables;

0.25% Factor

a. Bank Grade Obligations;
b. term deposits, bonds, and debentures (including commercial paper) rated “AA-” or higher that mature or are redeemable in less than one year.

0.5% Factor

a. Amounts currently receivable from Registered Insurers or Investment Grade Reinsurers. For a reinsurance contract held asset, the portion that is deemed to be currently receivable is the amount of the asset that is due to be paid to the insurer within 90 days, and is related to claims that have already been incurred.

0.75% Factor

a. term deposits, bonds, and debentures (including commercial paper) rated between "A-" and "A+", inclusive, that mature or are redeemable in less than one year.

1.25% Factor

a. term deposits, bonds, and debentures (including commercial paper) rated "AA-" or higher, that mature or are redeemable in one year or more.

2% Factor

a. term deposits, bonds, and debentures (including commercial paper), rated between "BBB-" and "BBB+", inclusive, that mature or are redeemable in less than one year;
b. investment income due and accrued;
c. accounts receivable outstanding 45 days or less from agents, brokers, subsidiaries, associates, and partnerships, including other receivables.
d. Reinsurance contracts held arising from Registered Insurers or Investment Grade Reinsurers, net of amounts currently receivable

2.25% Factor

a. term deposits, bonds, and debentures (including commercial paper) rated between "A-" and "A+", inclusive, that mature or are redeemable in one year or more.

4% Factor

a. term deposits, bonds, and debentures (including commercial paper) rated between "BBB-" and "BBB+", inclusive, that mature or are redeemable in one year or more; and
b. residential mortgages (see Mortgages section on page 9).

5% Factor

a. term deposits, bonds, and debentures (including commercial paper) rated between "BB-" and "BB+", inclusive, that mature or are redeemable in less than one year.

6% Factor

a. accounts receivable outstanding over 45 days but less than or equal to 60 days from agents, brokers, subsidiaries, associates, and partnerships, including other receivables.

7% Factor

a. term deposits, bonds, and debentures (including commercial paper) rated between "B-" and "B+", inclusive, that mature or are redeemable in less than one year.

8% Factor

a. term deposits, bonds, and debentures (including commercial paper) rated between “BB-” and “BB+”, inclusive, that mature or are redeemable in more than one year;
b. commercial mortgages (see Mortgages section on page 9).

10% Factor

a. accounts receivable outstanding over 60 days but less than or equal to 90 days from agents, brokers, subsidiaries, associates, and partnerships, including other receivables;
b. preference shares; and
c. term deposits, bonds, and debentures (including commercial paper) rated between “B-” and “B+”, inclusive, that mature or are redeemable in more than one year.

15% Factor

a. term deposits, bonds, and debentures (including commercial paper) rated CCC+ and below, that mature or are redeemable in less than one year;
b. accounts receivable, outstanding over 90 days, from agents, brokers, subsidiaries, associates, and partnerships, including other receivables;
c. other loans;
d. pension plans surplus that is reported as an asset on the insurer’s balance sheet to which the insurer, in the opinion of the FSC, has unrestricted and unfettered access;
e. Asset for Insurance Acquisition Cash Flows in respect of insurance contracts which have not yet been recognized in the financials
f. Assets not captured under the credit, market, and pooled arrangement risk categories of asset risk (see 2.3.1(a) to (e)) up to 1% times (total assets of the insurer or branch less assets in Investment Funds associated with equity-linked business); and
g. Investments in foreign life subsidiaries.

20% Factor

a. term deposits, bonds, and debentures (including commercial paper) rated CCC+ and below, that mature or are redeemable in one year or more.

35% Factor

a. term deposits, bonds, and debentures (including commercial paper) in arrears or default as to principal or interest

45% Factor

a. Computers, Furniture and Fixtures

Unrated Securities

For term deposits, bonds, and debentures (including commercial paper) for which the rating of the security, issuer, or guarantor, if any, is not available or is not rated, the credit risk factor is the sum of the credit risk factor for the deposit/bond/debenture with a rating equal to the long-term sovereign rating of the country in which the issuer or guarantor is established plus a factor of:

a. 0.25%, if the issuer or guarantor is a municipality or agency of the government of Jamaica
b. 0.75% if the ordinary shares of issuer or guarantor is trading on the Main Market of the Jamaica Stock Exchange
c. 1.5% if the ordinary shares of an issuer or guarantor is trading on the Junior Market of the Jamaica Stock Exchange or a stock exchange recognized by the FSC
d. 3.0% if the ordinary shares of an issuer or guarantor is neither trading on the Jamaica Stock Exchange nor on a stock exchange recognized by the FSC

Unknown redemption / asset maturity

In determining credit risk capital factors for an asset item, where information is not available to determine the redemption or maturity of an asset, life insurers and branches shall use the category with the highest credit risk capital factor for that asset.

Government of Jamaica Obligations Denominated in Foreign Currency

The credit risk factor applicable to Government Grade Obligations denominated in a foreign currency shall be a percentage specified by the FSC from time to time and shall be within the range 0% to 10% inclusive.

Investments Denominated in Foreign Currency

Investments denominated in foreign currency shall be treated as follows:

a. The balance sheet value of the investment shall be converted to Jamaican dollars using the exchange rate as defined in the section “Capital Required for Foreign Currency Risks”.
b. The credit risk factor used shall be the credit risk factor that would apply to an equivalent Jamaican dollar asset.

Repurchase Agreements

Repurchase agreements issued by securities dealers licensed by the FSC or regulated brokers that have a credit rating of BBB or higher attract a credit risk factor that is equal to the sum of:

a. the credit risk factor that would apply to direct investment in the security backing the agreement, and
b. 0.15%

Certificates of Participation

The credit risk factor that shall be applied to a Certificate of Participation (COP) is the same as for a direct investment in that asset.

In the case of a COP with more than one underlying asset, the credit risk factor to be applied is the average of the credit risk factors for those underlying assets, weighted by market value.

Details of the calculation of this credit risk factor shall be given in the Notes to the Schedules

Interest Receivables

a. the credit risk factor to be applied is the average of the credit risk factors for the relevant underlying assets, weighted by market value.
b. the details of the calculation of this credit risk factor shall be given in the Notes to the Schedules.

Mortgages

A credit risk factor of 4% shall be applied for

a. first mortgages on residential dwellings on the outstanding balance, excluding accrued interest, less insured balances and write-downs.
b. second mortgages for the purpose of acquiring or improving the residential dwelling if the insurer or branch holds the first mortgage on the dwelling to which the second mortgage applies.

Where a residential mortgage does not meet the criteria in the paragraph above, the credit risk factor for commercial mortgages will apply

A credit risk factor of 8% shall be applied for commercial mortgages and for mortgages secured on undeveloped land (namely construction financing), other than land used for agriculture or the production of minerals and a commercial investment property held for leasing.

Collateral and Guarantees

Recognition of collateral in reducing the capital required for credit risk is limited to cash, securities meeting the Government Grade or Bank Grade and securities with a credit rating of BBB or higher.

Where a rating is not available for the asset or counterparty where applicable, no reduction in capital required is permitted.

Collateral must be held throughout the period for which the asset is held or for which the exposure exists. Only that portion of an obligation that is covered by eligible collateral will be assigned the weight given to the collateral.

Investments (principal and interest) that have been explicitly, irrevocably, and unconditionally guaranteed by

a. a guarantor whose long-term issuer credit rating or,
b. a government, whose long-term sovereign credit rating,

is BBB or higher, or satisfies the Government Grade or Bank Grade criteria, attract the credit risk factor allocated to a direct claim on the guarantor where the effect is to reduce the risk.

Guarantees provided by a parent, a subsidiary or an associate are not eligible for this treatment under the above paragraph.

Where a rating is not available for the investment or guarantor where applicable, no reduction in capital required is permitted.

To be eligible, guarantees should cover the full term of the instrument and be legally enforceable.

Where the recovery of losses on a loan, financial lease agreement, security is partially guaranteed, only the part that is guaranteed is to be weighted according to the credit risk factor of the guarantor.

The details of the calculation of the credit risk factors reduced due to the recognition of collateral or guarantees shall be disclosed in the Notes to the Schedules.

Foreign Branches

Companies with Branches in foreign jurisdictions that hold statutory deposits are required to provide the amount of the statutorily required deposit, the actual amount of the deposit and the name of the financial institution holding the deposit.

2.3.1.2. Capital Required for Market Risk for Ordinary Shares

To determine capital required for market risk for each group of ordinary shares, multiply the applicable market risk factor by the balance sheet value of the group of ordinary shares. The total of these amounts represents the capital required for market risk for ordinary shares.

The market risk factors to be applied are as follows:

25% Factor

a. Ordinary shares of an issuer trading on the Main Market of the Jamaica Stock Exchange

35% Factor

a. Ordinary shares of an issuer trading on the Junior Market of the Jamaica Stock Exchange
b. Ordinary shares of an issuer trading on a stock exchange recognized by the FSC

45% Factor

a. Ordinary shares of an issuer that is neither trading on the Jamaica Stock Exchange nor a stock exchange recognized by the FSC

2.3.1.3. Capital Required for Market Risk for Real Estate

To determine capital required for market risk for each type of real estate multiply the applicable market risk factor by the balance sheet value of the type of real estate. The total of these amounts represents the capital required for market risk for real estate.

The market risk factors to be applied are as follows:

8% Factor

a. Freehold interest in land and buildings for own use (i.e. owner occupied)

15% Factor

a. Freehold interest in land and buildings acquired to generate income

2.3.1.4. Capital Required for Market Risk for Right-of-Use

To determine capital required for market risk for right-of-use for each lease arrangement, multiply the applicable market risk factor to the greater of

a. zero; and
b. the balance sheet value of the right-of-use asset less the balance sheet value of the associated right-of-use liability for the leasehold investment

The total of these amounts represents the capital required for market risk for right-of-use.

The market risk factors to be applied to each lease arrangement are as follows:

10% Factor

a. Leasehold interest in land and buildings for own use (i.e. occupied by the insurer or branch)

20% Factor

a. Leasehold interest in land and buildings acquired to generate income

45% Factor

a. Computer, Furniture and Fixtures; and
b. Other leases

2.3.1.5. Capital Required for Pooled Arrangement Risks

To calculate the capital required for pooled arrangement risks, a CISTP capital factor is applied by the balance sheet value of each CISTP that the insurer or branch is invested in. The resulting values are summed to arrive at the total capital required for pooled arrangement risks.

The capital factor to be applied to an investment in a CISTP is the weighted average of the credit and market risk factors for the assets in which the CISTP is invested, that is, the "look-through" method.

Capital factor for a CISTP = f1*A1 + f2*A2 + f3*A3 _... +fk*Ak

Where fi = credit or market risk factor for asset i

k = number of assets in which the CISTP is invested

Ai = fair value of asset i ÷ total fair value of the investment in the CISTP

The Notes to the Schedule must contain the details of the determination of each CISTP factor used.

2.3.1.6. Capital Required for Foreign Currency Risks

To calculate the capital required for foreign currency risk, a FX risk factor is applied to the absolute value of assets minus liabilities (including liabilities for incurred claims and liabilities for unexpired coverage) denominated in each foreign currency and converted to Jamaican currency. The resulting values are summed to arrive at the total capital required for foreign currency risk.

The FX risk factor to be applied to a foreign currency is as follows:

Reference	Foreign Currency	FX Risk Factor %
1	United States Dollar	5
2	Canadian Dollar, Pound Sterling, Euro	15
3	Bahamas, Barbados, Eastern Caribbean, Trinidad & Tobago Dollars	25

4	A foreign currency other than those specified in items 1-3 inclusive	30

Insurers and branches may take credit (reduce liabilities) for business ceded to re-insurers provided that reinsurance claims are payable in the same currency as the liability.

The net assets or liabilities in Jamaican dollars are the absolute value of the assets minus the liabilities multiplied by the exchange rate for each currency.

The exchange rate used for each currency shall be the risk weighted average spot selling rate as at the effective date of the LICAT calculation published by the Bank of Jamaica.

If this rate is not available in the currency being reported, then an appropriate rate shall be selected (or calculated from other rates) and used and the source of the rate shall be disclosed in the Notes to the Schedules.

2.3.1.7. Capital Required for Interest Rate Risks

A projected cash flow methodology is to be used to measure the economic impact of a specified interest rate stress scenario.

Required capital for interest rate risk is calculated as the decrease in the insurer's net position after revaluing asset and liability cash flows by decreasing the discount rates by 150bps (subject to a minimum discount rate of zero). The net position is equal to the difference between the present values of asset cash flows (including assets backing capital and surplus) and liability cash flows.

Cash flows are determined at the reporting date and are projected net of all reinsurance. No reinvestment of any asset cash flows should be assumed. Projected cash flows should not reflect loss provisions reported under IFRS 9 (i.e., asset cash flows should not be reduced by any amount on account of these provisions), and it should not include the impact of provisions for the risk of reinsurer non-performance under IFRS 17. Liability cash flows should correspond to IFRS fulfillment cash flows (incorporating risk adjustments but excluding contractual service margins). Projected asset and liability cash flows (except for liability cash flows associated with participating, adjustable and non-interest sensitive products) that are interest sensitive should be changed to be consistent with the interest rate scenario.

For participating, adjustable (excluding Universal Life) and non-interest sensitive products, the same liability cash flows are used before and after the interest rate shock. Adjustments to cash flows should not be made for anticipated change in dividends or other adjustable features that may result from the decrease in interest rates under the stress scenario. For Universal life products, credited rates on should be adjusted appropriately in the shocked scenario taking into account any minimum interest rate guarantees. Notwithstanding the above, cash flows projected for expenses and for benefit payments tied to inflation should reflect the impact of inflation assumptions that vary consistently with the interest rate shock.

2.3.2. Required Capital for Insurance Risk

Cash flows used to determine required capital for insurance risk are calculated using assumptions based on expected experience (Best Estimate). The change in assumptions (shock) is applied to the Best Estimate assumptions, unless otherwise indicated. Best Estimate and shocked cash flows are projected for the terms of the liabilities for each product.

The cashflows to be shocked for insurance risk are best estimate cashflows excluding risk adjustments, contractual service margins, and time value of guarantees. Required capital components for participating and adjustable products are calculated as if the products were non-participating and non-adjustable.

If an insurance contract liability for one or more policies is reported using the IFRS 17 premium allocation approach, then Best Estimate Cash Flows comprise outflows of projected future reductions in the liability for remaining coverage that will be recognized as insurance revenue, and inflows of projected future premium receipts.

The participating policy dividend scale should not reflect the impact of the insurance risk shocks.

All best estimate and shocked cash flows are projected net of registered reinsurance including stop loss treaties. Reinsurance in this regard refers to reinsurance that satisfies the requirements prescribed under the Insurance Act and the Reinsurer has an investment grade rating. Reinsurance with not-investment grade reinsurers or related parties does not qualify. Projected cash flows may reflect future planned recaptures as long as all the features of the recapture are also incorporated.

For the purpose of calculating the insurance risk components, best estimate and shocked cash flows are discounted at the rates specified by the FSC.

Capital is to be calculated for the following risks:

a. Mortality
b. Longevity
c. Morbidity
d. Lapse
e. Expense

Investment contracts and Administrative Services Only ("ASO") group contracts should be excluded completely from the calculation of the insurance risk requirement. ASO group contracts are those where an insurer bears no risk and has no liability for claims.

2.3.2.1. Mortality Risk

Level, trend, volatility and catastrophe risk components are calculated for all individual and group life insurance products that are exposed to mortality risk. Mortality risk required capital is calculated for accidental death and dismemberment products but not for products that cover longevity and morbidity risk.

Required capital for mortality risk is calculated using the following formula:

$$RC_{mortality} = \sqrt{(RC_{vol}^2 + RC_{cat}^2)} + RC_{level} + RC_{trend}$$

Required capital for mortality risk is calculated separately for life supported and death supported business. All individual and group life insurance products with mortality risk are designated as either life supported or death supported.

The insurer should partition its policies into sets with similar products and characteristics and then determine if each individual set is life supported or death supported.

In order to determine whether the policies are life supported or death supported the following test should be conducted. The present value of cash flows for each set is calculated using a -15% mortality level shock applied to the Best Estimate Assumptions for mortality rates and a +75% mortality trend shock applied to the Best Estimate Assumptions for mortality improvement, discounted using either financial statement liability discount rates, or the ultimate reinvestment rate. The result of this calculation is compared to the present value of Best Estimate Cash Flows using the same discount rates. If the present value of the shocked cash flows is greater than the present value of the Best Estimate Cash Flows, the set is designated as death supported business; otherwise, the set is designated as life supported.

Level Risk

The mortality level risk component is the difference between the present value of shocked cash flows and the present value of Best Estimate Cash Flows, determined separately for life and death supported business.

	Assumption Change (Shock)
Life supported business	15% increase in best estimate mortality rates at each age
Death supported business	15% decrease in best estimate mortality rates at each age

Trend Risk

The trend risk component is the difference between the present value of the shocked cash flows and the present value of Best Estimate Cash Flows at all years, determined separately for life and death supported business.

	Assumption Change (Shock)
Life supported business	75% decrease to the best estimate assumption for mortality improvement for 25 years, followed by no mortality improvement (i.e., a 100% decrease) thereafter.
Death supported business	75% increase in the best estimate assumption for mortality improvement at all policy durations

If a Best Estimate Assumption for mortality improvement is not used, the risk charge for trend risk is zero.

Volatility Risk

Volatility risk component is calculated in aggregate (i.e., life and death supported products) but separately for basic death and AD&D products and also separately for individual and group products.

The volatility risk component is: $\sqrt{\ \Sigma}_{\text{Basic Death}} RC^2 + \sqrt{\sum}_{\text{AD\&D}} RC^2$

where the sums are taken over all sets of basic death and AD&D products respectively, and RC is the volatility risk required capital component for the set of products.

The formula for RC is given by: 2.7 x A x E/F

A is the standard deviation of the upcoming year's projected net death claims for the set, defined by

$\sqrt{\sum} q(1-q)b^2$

Where the sum is taken over all policies, q is a particular policy's Best Estimate Assumption for mortality; and b is the death benefit for the policy, net of registered reinsurance.

E is the total net amount at risk for all policies in the set

F is the total net face amount for all policies in the set

Where there is insufficient data available to calculate A, various approximations are available as set out in Appendix A.

Catastrophe Risk

The catastrophe risk component is calculated in aggregate (i.e. life and death supported products together).

The shock for catastrophe risk is an absolute increase in the number of deaths per thousand lives insured in the year following the reporting date as follows:

	Increase in deaths per 1,000
Basic Death	2
AD&D	0.4

The catastrophe risk component is the difference between the present value of the shocked cash flows and the present value of the best estimate cash flows.

No Explicit Mortality Rate Assumption

In cases where an insurer does not use an explicit mortality rate assumption in the determination of its liabilities, shocks on mortality rates should be applied to net written premiums adjusted by the expected claims loss ratio, where this ratio includes both claims incurred and claims incurred but not reported.

For the level risk shock, the percentage shocks specified for mortality rate assumptions should instead be applied to adjusted net written premiums. For the catastrophe risk shock, the shocks specified for mortality rate assumptions should instead be applied to policy face amounts. For the volatility risk requirement, adjusted net written premiums may be used in place of C within the approximation formulas.

2.3.2.2. Longevity Risk

Longevity risk is the risk associated with the increase in liability cash flows due to increases in life expectancy caused by changes in the level and trend of mortality rates.

The following formula is used to calculate longevity risk required capital:

$RC_{\text{longevity}} = RC_{level} + RC_{trend}$

Longevity	Assumption Change (Shock)
Level Risk	15% decrease in mortality rates at each age
Trend Risk (Mortality Improvement)	75% increase in the best estimate assumption for mortality improvement for all future years

The required capital is the difference between the present value of shocked cash flows and the present value of best estimate cash flows.

2.3.2.3. Morbidity Risk

Morbidity risk is the risk associated with the variability in liability cash flows arising from the incidence of policyholder disability or health claims (including critical illness), and from termination rates.

Morbidity risk required capital components are calculated for level, trend, volatility and catastrophe risks. Total required capital for morbidity risk is calculated using the following formula:

$RC_{\text{morbidity}} = \sqrt{(RC_{vol}^2 + RC_{cat}^2)} + RC_{level} + RC_{trend}$

Level Risk

For active lives, the shock for level risk applies to all products for which the guaranteed premium rate period exceeds 12 months. The shock is a permanent increase in Best Estimate Assumptions for morbidity incidence rate at each age.

For disabled lives, the shock for level risk is a permanent decrease in Best Estimate Assumptions for the morbidity termination rate at each age.

Termination rates should not be changed when applying incidence rate shocks. Termination rate shocks are applied to the total termination rate, which includes terminations due to recovery and due to death.

Exposure Base	Product Type	Shock Factor
Incidence Rates	Active DI / WP	+25%
	CI	+35%
	Active LTC	+30%
	Other	+20%
Termination Rates	Disabled WP	-30%
	Disabled DI, LTD, STD, LTC	-25%

The morbidity level risk component is the difference between the present value of the shocked cash flows and the present value of best estimate cash flows

Return of premium riders are included in the cash flows of the underlying products.

In cases where an insurer does not use incidence and termination rate assumptions in the determination of its liabilities, shocks on incidence or termination rates should be applied to net written premiums adjusted by the expected claims loss ratio (i.e., the percentage shocks specified for incidence/termination rate assumptions should instead be applied to net written premiums adjusted by the loss ratio for level, volatility and catastrophe risk shocks). The expected claims loss ratio should include both claims incurred and claims incurred but not reported.

Trend Risk

A trend risk component is calculated for:

1) Products with a guaranteed premium rate period for active lives of two years or more, such as individual CI, individual active life DI and other A&S; and

2) Products that provide benefits to disabled lives, such as LTD, DI and WP

The shock for trend risk is a permanent 100% decrease in the Best Estimate Assumption for morbidity improvement. The shocked cash flows for trend risk are calculated using best estimate cash flows and an annual morbidity improvement rate assumption of 0%. **If a Best Estimate Assumption for morbidity improvement is not used, the risk charge for trend risk is zero.**

Volatility Risk

The volatility risk component is calculated as a one-time shock to first-year incidence rates for all active lives that are exposed to morbidity risk. Termination rate assumptions should not change as a result of the shocks to incidence rates.

The first-year factors for the volatility risk shocks are listed below:

Exposure Base	Product Type	Shock Factor
Incidence Rates	Individual Active DI / WP	+25%
	Individual CI	+50%
	Individual Active LTC	+30%
	Individual Medical	+15%
	Individual Dental	+20%
	Individual Travel / Credit Insurance	+30%
	Other A&S	+30%
	Group active STD, LTD & WP	+25%
	Group CI	+50%
	Group Active LTC	+30%
	Group Medical	+15%
	Group Dental	+20%
	Group Travel / Credit Insurance	+50%

The morbidity volatility risk component is the difference between the present value of the shocked cash flows and the present value of best estimate cash flows.

Catastrophe Risk

The catastrophe risk component is calculated as a one-time shock to first year incidence rates for all active lives that are exposed to morbidity risk. The shock is applied as a multiple of the Best Estimate Assumption for morbidity (i.e., (1 + shock factor) x Best Estimate Assumption). Catastrophe shocks are not applied to incidence rates for group medical or dental insurance, or to individual or group travel or credit insurance.

The factors for catastrophe risk shocks are listed below:

Exposure Base	Product Type	Shock Factor
Incidence Rates	Individual Active DI	+25%
	Group active STD and LTD	+25%
	Individual and group active WP	+25%
	Individual and Group CI	+5%
	Individual and Group Active LTC	+10%
	Other A&S (other than disability and CI)	+25%

The morbidity catastrophe risk component is the difference between the present value of the shocked cash flows and the present value of best estimate cash flows.

2.3.2.4. Lapse Risk

Lapse risk is the risk associated with the variability in liability cash flows due to the incidence of policyholder lapses and other policyholder behaviour. Lapse risk includes risk arising from options that allow policyholders to fully or partially terminate an insurance contract, or to decrease or suspend/resume insurance coverage (e.g. the option to reduce premiums in universal life contracts).

Lapse risk required capital is calculated for all individual life insurance, individual active DI, individual critical illness, individual active life LTC and other A&S policies that are exposed to lapse risk.

Lapse risk required capital is calculated using the following formula:

RC_{lapse} = maximum(RC_{cat} , $RC_{level+\text{trend}+\text{volatility}}$)

Required capital components are calculated separately for lapse supported and lapse sensitive business.

Lapse supported and lapse sensitive business

The direction of the lapse shock should be tested to determine whether the business is lapse supported or lapse sensitive. An insurer should use the product partitions it has in place for setting its Best Estimate Assumptions for lapses (which should result in sets with similar products and characteristics), and then test each individual set by applying the level, trend and volatility shocks combined to determine if the set is lapse supported or lapse sensitive. For the purpose of the designation test, the shocks should be applied first as an increase in lapse rates (lapse sensitive) in all policy years, and then as a decrease in lapse rates (lapse supported) in all policy years. The designation is made by set based on the largest present value using either financial statement valuation discount rates, or the ultimate reinvestment rate.

Level, Trend & Volatility Risk

A combined component is calculated for level, trend & volatility risk. The combined shock is a permanent ±30% change in Best Estimate Assumptions for the lapse rate at each age and duration. Insurers should determine the direction of the shocks by comparing cash surrender values net of surrender charges with Best Estimate Liabilities at each duration. At durations where net cash surrender values are higher than Best Estimate Liabilities, lapse rates are shocked upwards, and at all other durations they are shocked downwards.

If any shock increases a lapse rate above 97.5%, the shocked lapse rate is capped at 97.5%.

The required capital for lapse risk is the difference between the present value of the shocked cash flows and the present value of best estimate cash flows.

Catastrophe Risk

The shocks for catastrophe risk are:

	Assumption Change (Shock)
Lapse sensitive products	an absolute increase of 20 percentage points in the Best Estimate Assumption (capped at 97.5%) for lapse for the first year only

Lapse supported products	a 40% proportional reduction of the Best Estimate Assumption for lapse in the first year only

The catastrophe risk component for any policy set cannot be negative.

The lapse catastrophe risk component is the difference between the present value of shocked cash flows and the present value of best estimate cash flows.

2.3.2.5. Expense Risk

Expense risk is the risk associated with the unfavourable variability of expenses incurred in servicing insurance or reinsurance contracts (e.g. the variability in expense liability cash flows due to the variation of the in force policies, excess claims, lapses and surrenders, new business decrease and other circumstances that could have an impact on unit expenses).

The shock is a permanent shock on the Best Estimate Assumptions for expenses including inflation for all insurance products.

	Assumption Change (Shock)
Expense	+20% in the first year followed by a permanent increase of 10% in all subsequent policy years

Expense shocks are applied to maintenance expenses. Premium taxes and investment income tax are excluded.

Required capital for expense risk is the difference between the present value of the shocked cash flows and the present value of best estimate cash flows.

2.3.3. Capital Required for Operational Risk

To calculate the capital required for operational risk, an operational risk factor of 5% is applied to the diversified capital requirement (see section 2.3.5)

2.3.4. Contractually Adjustable Product Credit

A credit may be applied only for products where the policy contract explicitly discloses that the insurer may change administrative fees without the policyholder's consent and the insurer can demonstrate, to the FSC's satisfaction, that it annually reviews the product's experience and considers the potential impact of adjustments.

The credit is calculated as the difference between the present value of fulfilment cashflows (incorporating risk adjustments but excluding contractual service margins) before and after adjusting administrative fees using the discount rates specified by the FSC. The adjustment to administrative fees shall begin in year 2 after the valuation date and continue for 5 years. In each year administrative fees shall be allowed to increase in line with the ultimate inflation rate assumption. e.g. if valuation inflation is assumed to be 5%, 4%, then 3% thereafter; there will be a 3% adjustment each year for 5 years starting from 2 years after the valuation date.

2.3.5 Diversification Credit

The diversified capital requirement for asset and insurance risk is calculated by aggregating the individual required capital components using the following formula.

$$\sqrt{\sum corr_{ij} \times RC_i \times RC_j} \text{ for all combinations of i and j}$$

Where:

RC_i is the required capital for risk i

$corr_{ij}$ is the correlation factor between risks i and j, as specified by the following correlation matrix

	Mortality	Longevity	Morbidity claims	Morbidity termination	Lapse sensitive	Lapse supported	Expense	Asset
Mortality	1							
Longevity	-0.25	1						
Morbidity claims	0.75	-0.25	1					
Morbidity termination	-0.25	0.75	0.5	1				
Lapse sensitive	-0.25	0.75	0	0.5	1			
Lapse supported	0.75	-0.25	0	-0.25	-0.25	1		
Expense	0.75	0.25	0.75	0.5	0.25	0.75	1	
Asset	0.5	0	0.75	0.75	0.75	-0.25	0.75	1

The diversification credit is the difference between sum of the individual required capital components and the diversified capital requirement.

Appendix A – Approximations for A used in Mortality Volatility calculation

The following table sets out the approximations that are available to estimate A (the standard deviation of the upcoming year's projected net death claims) where there is insufficient data available to calculate A exactly.

Condition	Approximation for A	Definition of Terms
Standard deviation of the net death benefit amounts for all policies in the set is known	$\sqrt{}(C \times \sum b^2/F)$	C is the projected value of the upcoming year's total net death claims for all policies in the set b is the net death benefit for the policy F is the total net face amount for all policies in the set
Standard deviation of the net death benefit amounts is not known – approximation uses a comparison set. Note the conditions below for the use of the comparison set.	$\frac{A_C \times \sqrt{N_C}}{C_C} \times \sqrt{C} \times \sqrt{\max(F/n, C/N)}$	A_C is the exact factor A calculated for the comparison set N_C and N are the total numbers of deaths projected to occur over the upcoming year for all policies in the comparison set and all policies in the set for which A is being approximated C_C and C are the projected values of the upcoming year's total net death claims for all policies in the comparison set and all policies in the set for which A is being approximated F is the total net face amount for the policies in the set for which A is being approximated n is the total number of lives covered under the policies in the set for which A is being approximated
The set consists entirely of traditional	$1.75 \times \sqrt{C} \times \sqrt{\max(F/n, C/N)}$	Terms as defined above

Condition	Approximation for A	Definition of Terms
employer-sponsored group policies		
Standard deviation of the net death benefit amounts is not known	$\sqrt{C} \times \sqrt{\left(b_{min} + b_{max} - \frac{b_{min} \times b_{max}}{F/n}\right)}$	C is the projected value of the upcoming year's total net death claims for all policies in the set b_{min} is less than or equal to the lowest single-life net death benefit amount of any policy or certificate in the set b_{max} is the highest single-life net death benefit amount or retention limit of any policy or certificate in the set F is the total net face amount for the policies in the set n is the total number of lives covered under the policies in the set
Standard deviation of the net death benefit amounts is not known Total face amount and number of lives is not known Lowest single-life net death benefit is not known	$\sqrt{C} \times b_{max}$	Terms as defined above

Conditions for use of comparison set:

(1) No evidence that the dispersion of the distribution of net death benefit amounts, as measured by the ratio of the standard deviation to the mean, of the comparison set is likely to be lower than that of the set for which A is being approximated

(2) Insurers should use comparison sets of individual products to approximate factors for sets of individual products, and likewise for group products. Insurers may use sets of basic death products to approximate factors for sets of AD&D products, but not vice versa

(3) For any particular set of products used as a comparison set, the number of covered lives in the comparison set must be greater than or equal to the total number of covered lives summed over all sets for which factors are approximated based on the comparison set

(4) If this approximation is used for sets of individual basic death products, the sets in aggregate must not be material relative to the insurer's entire book of business.