Technical note

Explanatory text and examples on ICS

About the IAIS

The International Association of Insurance Supervisors (IAIS) is a voluntary membership organisation of insurance supervisors and regulators from more than 200 jurisdictions. The mission of the IAIS is to promote effective and globally consistent supervision of the insurance industry in order to develop and maintain fair, safe and stable insurance markets for the benefit and protection of policyholders and to contribute to global financial stability.

Established in 1994, the IAIS is the international standard-setting body responsible for developing principles, standards and other supporting material for the supervision of the insurance sector and assisting in their implementation. The IAIS also provides a forum for Members to share their experiences and understanding of insurance supervision and insurance markets.

The IAIS coordinates its work with other international financial policymakers and associations of supervisors or regulators, and assists in shaping financial systems globally. In particular, the IAIS is a member of the Financial Stability Board (FSB), member of the Standards Advisory Council of the International Accounting Standards Board (IASB), and partner in the Access to Insurance Initiative (A2ii). In recognition of its collective expertise, the IAIS also is routinely called upon by the G20 leaders and other international standard-setting bodies for input on insurance issues as well as on issues related to the regulation and supervision of the global financial sector.

For more information, please visit www.iais.org and follow us on LinkedIn: IAIS – International Association of Insurance Supervisors.

International Association of Insurance Supervisors
c/o Bank for International Settlements
CH-4002 Basel
Switzerland
Tel: +41 61 280 8090

This document is available on the IAIS website (www.iais.org).

IAIS

Contents

0 Introduction

This document contains examples and explanatory text aimed to facilitate the understanding and implementation of the Insurance Capital Standard (ICS). Its content originates from the 2024 ICS data collection technical specifications, and should be read in conjunction with the ICS Level 1 and Level 2 texts. To facilitate that joint reading, the numbering of sections and subsections of this document follows the same structure as the ICS Level 1 and Level 2 texts.

1 General guiding principles

1.1 Substance over form

1.2 Proportionality

Example of proportionality for MAV

Consider a portfolio of inflation indexed annuities. In theory, a full stochastic modelling of future inflation may be needed. However, considering:

- The complexity of such a modelling (and justification of the associated parameters); and
- That inflation and mortality are assumed to not be correlated

IAIGs may use a flat future level of inflation for deriving future annuity payments in the calculation of insurance liabilities.

Example

Consider an IAIG with capital resources of 10 and insurance liabilities (savings contracts) of 100. The calculation of those insurance liabilities can be achieved either on a policy by policy basis, or by grouping all policies and using an average actuarial age and average lapse rates. The latter leads to a difference of 1% in the amount of insurance liabilities. Although such a difference can be considered as non-material with regard to the insurance liabilities, the relative impact on the capital resources is 10% (assuming the asset side is unchanged). This should be considered a material difference, and the simplification should be rejected.

Please note this example is in no way intended to mean that the materiality threshold is 10% of capital resources.

1.3 Look-through

1. In the context of Market risks, look-through is applied, for instance, to collective investment funds, hedge funds, mandatory convertible bonds, etc. in order to identify all of the indirect exposures

embedded in such instruments. A look-through approach is applied to the extent possible, in order to identify which assets are sensitive to the stress-based approaches to measuring risks. A similar approach can be applicable in the context of capital resources, in order to identify any relevant adjustments to ICS capital resources in respect of indirect holdings or reciprocal cross holdings.

2. In the context of Insurance risks, the look-through approach is applied to the underlying risk of investments such as single tranche mortality bonds, catastrophe bonds, etc. in order to appropriately capture the effect on such instruments of the stress scenarios designed for mortality, longevity, catastrophe events and any other relevant scenario.

1.4 ICS Rating Categories

[No explanatory text in this section]

2 Perimeter of the ICS Calculation

[No explanatory text in this section]

3 Market-Adjusted Valuation

3.1 Valuation principles

Example

Subordinated debt issued by the IAIG should not be revalued to market prices. However, the present value of the liability should be updated to reflect changes in the time value of money (update of yield curves).

3. The following balance sheet items' valuation should be based on the IAIG's reported International Financial Reporting Standards (IFRS) or GAAP valuations, as applicable for consolidated audited general-purpose financial statements in each IAIG's respective home jurisdiction:

a. Goodwill and other intangibles;

b. Pension assets/liabilities;

c. Other assets (including other reinsurance and other insurance-related assets);

d. Provisions other than insurance liabilities;

e. Contingent liabilities: add contingent liabilities that are reported in the notes to financial statements in the balance sheet; and

f. Other non-financial liabilities.

3.2 Current Estimate

3.2.1 Basis for calculation

3.2.1.1 General considerations

Example

Future expenses of the IAIG should be allocated to all contracts within the contract boundaries. The current estimate should not include the premium, expenses and claims for contracts out of the contract boundaries. The expense assumptions should be on a going concern basis and, *ceteris paribus*, consistent with the prior years.

Therefore if a contract is underwritten on 31.12.N, the current estimate should not reflect the paid expenses to settle the policy (eg costs associated with pricing the product and selling the product etc.), but should reflect future related expenses (eg overhead, claims management expenses etc.).

Calculation example (Non-life)

Allocate the overhead expenses to premiums/claims by determining a per policy/claim expense on a going concern basis and multiply by the policies/claims. The result is that overhead expenses are recognised consistently with premiums/claims.

4. The current estimate of non-life premium liabilities (PL) should include, but is not limited to the following cash flows:

- Cash flows from future premiums falling within the contract boundary.
- Cash flows resulting from future claim events (including the potential for claims that have high severity, low probability of occurrence).
- Cash flows arising from all expenses stemming from premiums and on-going administration of existing and future business falling within the contract boundary (a non-exhaustive list of examples includes: administrative expenses, investment management expenses, claim management expenses, acquisition expenses, overhead expenses, commission payments, premium collection costs and investment-related expenses). Acquisition costs should be included in the premium liabilities valuation and not reflected as an asset on the balance sheet.

5. Two proxies can be considered for the purpose of calculating non-life premium liabilities.

a. The first proxy attempts to approximate the concept of a current estimate, through the application of a formula composed of several elements:

$$PL = (CR - AER) \times UPR + (CR - 1) \times PVFP$$

Where:

PL = Premium liability

CR = Combined ratio (including all expenses)

AER = Acquisition expense ratio

UPR = Unearned premium reserves (difference between written premiums for all contracts on the balance sheet at the valuation date and earned premiums)

PVFP = Present value of future premiums (within contract boundaries)

b. A second proxy may be used if, for materiality or other reasons, the IAIG needs to further simplify the calculation, in the case where the combined ratio is smaller than 1:

$$PL = UPR = Premiums\ Written - Premiums\ Earned$$

6. The current estimate for claim liabilities should reflect all cash flows arising from claims that happened before the valuation date, including incurred but not reported (IBNR) claims.

3.2.1.2 Options and guarantees

Example

Variable annuities may contain guaranteed living benefits (eg minimum maturity or withdrawal benefits) tied to the performance of specific assets, which may cause a path dependency of the liability cash flow.

3.2.1.3 Policyholder behaviour

[No explanatory text in this section]

3.2.1.4 Future discretionary benefits

Example

For participating products that have benefits paid linked to the investment returns of the IAIG's asset portfolio, currently held assets should be reflected in the projection of participating cash flows. As new investments occur in the projection, these new investments should be assumed to earn a yield consistent with the prescribed discount curve. As a result, the asset portfolio rate will begin at the IAIG's current assumed book portfolio rate used in the calculation of participating cash flows and converge with the prescribed yield curve as inforce assets mature and new investments are made.

Similarly, where stresses require valuations assuming a different yield curve, liability cash flows should be re-projected to reflect convergence of the returns of the asset portfolio to the prescribed stressed yield curve and participating cash flows should reflect the expected amount of pass through that would occur under the stress given the resulting portfolio investment returns.

Consider a simplified example: assume a participating product passes through an IAIG's investment experience without a spread or guaranteed minimum crediting rate. Assume the portfolio yield on a book basis of assets held at the valuation date is 5% and the prescribed yield curve is consistent with a flat 2% for all years. 20% of the initial assets mature each year until all starting assets have matured by the end of year 5. Application may look as follows:

Year	1	2	3	4	5	6	7	8
Asset Book Portfolio Rate	5.0%	4.4%	3.9%	3.4%	2.9%	2.0%	2.0%	2.0%
Projected Liability Crediting Rate	5.0%	4.4%	3.9%	3.4%	2.9%	2.0%	2.0%	2.0%
Prescribed Market Rate/Discount Rate	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%

*Note that based upon the rate of asset turn-over, the degree of cash flow matching and the type of assets held, the pattern may evolve differently.

The initial asset portfolio rate turns over to the prescribed yield curve and the yield of assets held at the valuation date is explicitly included.

3.2.2 Contract recognition, contract boundaries and time horizon

Example

Consider a contract providing health coverage starting on 1 March N+1. The contract has been underwritten on 20 December N, with no possibility to change the terms of the contracts before the coverage starts. On 31 December N, this contract should be recognised in the balance sheet.

Example

Consider an annually renewable life protection policy sold on a group basis. The IAIG does not manage this portfolio on a contract-by-contract basis, but can freely adjust the premiums for the entire portfolio at the policy anniversary date, to fully reflect the risks stemming from that portfolio. In this case, the conditions defined in paragraph 91 are deemed to have been met. The calculation of current estimates should not include any premiums beyond the next future anniversary date where such adjustment is possible, along with the related claims and expenses.

Example

Consider a whole life policy, with a level premium. According to the terms of the insurance contract, the IAIG cannot reject any premium, and the premium is constant throughout the life of the contract. Therefore, all (probability-weighted) future premiums of this contract should be taken into account in the insurance liabilities, along with the related claims and expenses.

Example

Consider a health policy (medical expenses), starting on 1 July N, with a premium paid monthly. Premium indexation is possible at each anniversary date, and the IAIG has no right to cancel the policy during the first 12 months. On 31 December N, insurance liabilities should include 6 months of future premiums (January – June N+1), along with the related claims and expenses.

3.2.3 Data quality and setting of assumptions

[No explanatory text in this section]

3.2.4 Management actions

[No explanatory text in this section]

3.2.5 Discounting

3.2.5.1 Determination of yield curves for current estimate discounting

[No explanatory text in this section]

3.2.5.2 Determination of the risk-free yield curve

[No explanatory text in this section]

3.2.5.3 Determination of the adjustment to the risk-free yield curve

3.2.5.3.1 Classification criteria

Figure 1: Example of additional information for portfolios reported in the Middle Bucket

Example with a LOT of 20 years	Additional information for portfolios reported in the Middle Bucket																					
	Total	Y0	Y1	Y2	Y3	Y4	Y5	Y6	Y7	Y8	Y9	Y10	Y11	Y12	Y13	Y14	Y15	Y16	Y17	Y18	Y19	Y20
Liability Cashflows	2565	0	10	15	30	20	80	100	60	120	200	350	480	200	200	100	200	400	0	0	0	0
Asset Cashflows	4690	800	20	30	75	540	100	95	50	130	550	400	500	220	50	500	30	600	0	0	0	0
of which same currency	4145	600	20	30	75	500	100	90	40	100	550	300	500	200	40	400	0	600	0	0	0	0
of which different currency after haircut	545	200	0	0	0	40	0	5	10	30	0	100	0	20	10	100	30	0	0	0	0	0
Premium Cashflows	255	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	0	0	0	0
Discount factor using risk free yield curve		1	0.99	0.98	0.97	0.96	0.95	0.94	0.93	0.92	0.91	0.9	0.89	0.88	0.87	0.86	0.85	0.84	0.83	0.82	0.81	0.8
Market value assets eligible for cash flow test	3863.6		Criterion d: Value of included future premiums								234.6											
market value assets not eligible for cash flow test	500		% of future premiums in assets								5.4%											
			% of hedged cash flow post haircut on assets								11.6%											

3.2.5.3.2 Adjustments to the yield curve

[No explanatory text in this section]

3.2.5.3.2.1 Eligible investments

[No explanatory text in this section]

3.2.5.3.2.2 Top Bucket

Figure 2: Example to assess the matching criterion for the Top Bucket eligibility

Example with a LOT of 20 years	Assessing the matching criterion for the **Top** Bucket eligibility																					
	Total	Y0	Y1	Y2	Y3	Y4	Y5	Y6	Y7	Y8	Y9	Y10	Y11	Y12	Y13	Y14	Y15	Y16	Y17	Y18	Y19	Y20
Liability Cashflows	4635	0	10	15	30	20	80	100	60	120	200	350	480	200	0	700	350	400	350	800	320	50
Asset Cashflows	5800	800	20	30	75	540	100	95	50	130	550	400	500	220	50	500	30	410	400	500	300	100
Premium Cashflows																						
Matching (In-Out)?		800	10	15	45	520	20	-5	-10	10	350	50	20	20	50	-200	-320	10	50	-300	-20	50
Use carryforward?		No	No	No	No	No	No	Yes	Yes	No	No	No	No	No	No	Yes	Yes	No	No	Yes	Yes	No
Remaining Cash		800	810	825	870	1390	1410	1405	1395	1405	1755	1805	1825	1845	1895	1695	1375	1385	1435	1135	1115	1165
Cumulative liability CF		0	10	25	55	75	155	255	315	435	635	985	1465	1665	1665	2365	2715	3115	3465	4265	4585	4635
Cumulative carryforward used		0	0	0	0	0	0	5	15	15	15	15	15	15	15	215	535	535	535	835	855	855
Carryforward used		18%	Failed, used carryforward/total liability CF>10%																			

3.2.5.3.2.3 Middle Bucket

Example

The following assets back liabilities that are eligible for the Middle Bucket.

Government bonds:100

Corporate bonds ICS RC1:50

Corporate bonds ICS RC2:30

Equity:70

Cash: 10

$$w_{gov} = \frac{100}{100+50+30} = \frac{5}{9}$$

$$w_{ICS\,RC1} = \frac{50}{100+50+30} = \frac{5}{18}$$

$$w_{ICS\,RC2} = \frac{30}{100+50+30} = \frac{1}{6}$$

Equity is not eligible according to paragraph L2-72 and therefore not considered for the calculation of the weights. Cash is excluded according to Table 3 and therefore not considered for the calculation of the weights.

Figure 3: Example to assess the matching criterion for the Middle Bucket eligibility

Example with a LOT of 20 years	Assessing the matching criterion for the **Middle** Bucket eligibility																					
	Total	Y0	Y1	Y2	Y3	Y4	Y5	Y6	Y7	Y8	Y9	Y10	Y11	Y12	Y13	Y14	Y15	Y16	Y17	Y18	Y19	Y20
Liability Cashflows	2565	0	10	15	30	20	80	100	60	120	200	350	480	200	200	100	200	400	0	0	0	0
Asset Cashflows	4690	800	20	30	75	540	100	95	50	130	550	400	500	220	50	500	30	600	0	0	0	0
Premium Cashflows		15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	0	0	0	0
Matching (In-Out)?		815	25	30	60	535	35	10	5	25	365	65	35	35	-135	415	-155	215	0	0	0	0
Use carryforward?		No	No	No	No	No	No	No	No	No	No	No	No	No	Yes	No	Yes	No	No	No	No	No
Remaining Cash		815	840	870	930	1465	1500	1510	1515	1540	1905	1970	2005	2040	1905	2320	2165	2380	2380	2380	2380	2380
Cumulative liability CF		0	10	25	55	75	155	255	315	435	635	985	1465	1665	1865	1965	2165	2565	2565	2565	2565	2565
Cumulative carryforward used		0	0	0	0	0	0	0	0	0	0	0	0	0	135	135	290	290	290	290	290	290
Cumulative carryforward as a percentage of cumulative		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	7%	7%	13%	11%	11%	11%	11%	11%

Example

The test in Figure 3 is failed in year 15 ($M = 14$). According to the assumption the LOT is 20 years and the lifetime of the liabilities 16 years.

$$TOM = \min\left(\frac{14}{\min(20,16)}, 100\%\right) = 87{,}5\%$$

3.2.5.3.2.4 General Bucket

3.2.5.3.2.5 Modulation Factor ω_i

Example

USD credit spreads are used to proxy spreads for AUD, CAD, HKD, ILS, INR, KRW, MXN, MYR, PEN, PHP, SAR, SGC, THB and TWD. These currencies form one currency spread bucket. If the main currency of liabilities is eg HKD then all assets backing these liabilities denominated in one of the currencies in this bucket can be used for the calculation of the modulation factor.

Example: The relevant yield curve for an asset will be typically of the form:

$$spot\ rate(t) = risk\ free\ spot\ rate(t) + spread$$

where $spread$ is chosen such that the discounted cash flows using $spot\ rate(t)$ yield the market value of the asset.

3.3 Margin over Current Estimate (MOCE)

[No explanatory text in this section]

3.4 Obligations replicable by a portfolio of assets

[No explanatory text in this section]

4 Capital resources

4.1 General considerations

[No explanatory text in this section]

4.2 Classification of financial instruments

4.2.1 Tier 1 Unlimited financial instruments

[No explanatory text in this section]

4.2.2 Tier 1 Limited financial instruments

7. For the purpose of assessing compliance of an instrument with criterion e., the conditions for supervisory approval (assessment of post-redemption solvency, assessment of the economic character of the call) should be specified upon issuance of the instrument. This can be included for instance in the terms and conditions of the instrument, in a public document specifying the applicable supervisory practice with that respect, in a letter from the supervisor to the IAIG, etc.

4.2.3 Tier 2 financial instruments (other than structurally subordinated)

8. For the purpose of assessing compliance of an instrument with criterion e., the conditions for supervisory approval should be specified upon issuance of the instrument. This can be included for instance in the terms and conditions of the instrument, in a public document specifying the applicable supervisory practice with that respect, in a letter from the supervisor to the IAIG, etc.

4.2.4 Structurally subordinated Tier 2 financial instruments

4.2.4.1 National discretion on acceleration clauses

4.2.5 Tier 2 Non-paid-up capital

9. Non-paid-up capital items may take a number of different forms, including unpaid preference shares, unpaid subordinated debt, letters of credit, guarantees and mutual member calls.

4.3 Capital elements other than financial instruments

4.3.1 Tier 1 capital elements

10. Retained earnings are defined as the accumulated balance of income less losses resulting from operations, including earnings retained as surplus held in the participating policyholders' equity account for joint stock companies, and in the non-participating account for mutual companies.

11. Share premium include for example members' contributions and initial funds for mutual companies and other contributions by shareholders in excess of amounts allocated to share capital for joint stock companies.

12. Minority/Non-controlling interests (NCI) represent third party equity interest in consolidated subsidiaries. This includes any interest generated by share issuance and subsequent changes in reserves of issuing entities.

4.3.2 Tier 2 capital elements

[No explanatory text in this section]

4.4 Capital adjustments and deductions

4.4.1 Deductions from Tier 1 capital resources

13. In determining reciprocal cross holdings between financial institutions that artificially inflate the Tier 1 capital position of the IAIG, as well as direct and indirect investments in own Tier 1 instruments not otherwise eliminated, the IAIG should apply a look-through approach (as described in Section 1.3).

14. Non-qualifying reinsurance refers to agreements:

a. With entities providing reinsurance that are neither regulated nor subject to risk-based solvency supervision, including appropriate capital requirements; or

b. That do not provide a sufficient transfer of risk.

4.4.2 Deductions from Tier 2 capital resources

4.4.3 Treatment of encumbered assets

15. An encumbered asset is an asset that the IAIG has pledged as collateral to a counterparty to either meet regulatory requirements or in order to participate in certain activities involving for instance: centrally cleared derivatives, over-the-counter (OTC) derivatives, mortgage borrowing, on-balance sheet repurchase agreements/securities lending and reverse repurchase agreements/securities lending, letters of credit/guarantees, collateral for reinsurance, assets held in trust, etc.

4.4.4 Limit on non-controlling interests

[No explanatory text in this section]

4.5 Capital composition limits

[No explanatory text in this section]

5 Capital requirement – the standard method

5.1 ICS risks and calculation methods

5.1.1 Risk mitigation techniques

[No explanatory text in this section]

5.1.2 Geographical segmentation

[No explanatory text in this section]

5.1.3 Management actions

Example: Management actions considered after an equity stress

Consider an IAIG with a portfolio of savings contracts. Those savings contracts do not include any legally enforceable profit participation, however the IAIG has an internal policy aimed at redistributing approximately 80% of each year's financial profits (when positive) to policyholders. Such a policy leads to an amount of 80 of discretionary benefits in the current estimate figure, corresponding to the maximum loss absorbency that the IAIG would be able to pass through to policyholders in case of adverse financial scenarios.

However, for reasons of competitiveness and avoiding mass lapses, the IAIG is, in practice, not likely to pass through the maximum possible amount of loss to policyholders. For instance, while a drop of 40% in the value of its equity investments would have a negative impact of 100 on the value of assets, and normally result in an amount of discretionary benefits reduced to 0 by applying the distribution policy unchanged, the IAIG could assume that it would decide to distribute future discretionary benefits for an amount of 30. Therefore, the impact of the shock after management actions would be 100 – (80 – 30) = 50.

This example can be summarised as follows:

Balance sheet before shock:

Assets	**1000**	**Capital resources**	**150**
of which equity	*250*	**MOCE**	**50**
of which other	*750*	**Current estimate**	**800**
		of which discretionary	*80*

Balance sheet after shock, before management actions:

Assets	**900**	**Capital resources**	**50**
of which equity	*150*	**MOCE**	**50**
of which other	*750*	**Current estimate**	**800**
		of which discretionary	*80*

Balance sheet after shock, after management actions:

Assets	**900**	**Capital resources**	**100**
of which equity	*150*	**MOCE**	**50**
of which other	*750*	**Current estimate**	**750**
		of which discretionary	*30*

5.2 Insurance risks

5.2.1 Grouping of policies for life insurance risks

16. For some policies, an upward stress may produce an increase in the risk charge, while for others a downward stress may result in an increase in the risk charge. Even if cash flow projections are mostly performed at a policy level, to determine whether to apply an upward or a downward stress, it is necessary to decide on the appropriate grouping of policies.

5.2.2 Calculation of Life risk charges

5.2.2.1 Mortality risk

17. No geographical diversification is assumed when calculating the Mortality risk charge.

18. Even though the stresses are applied to different geographical regions, double counting of the risk mitigating impact of reinsurance arrangements covering more than one geographical area should be avoided.

5.2.2.2 Longevity risk

19. Even though the stresses are applied to different geographical regions, double counting of the risk mitigating impact of reinsurance arrangements covering more than one geographical area should be avoided.

5.2.2.3 Morbidity and Disability risk

5.2.2.3.1 Segmentation

20. The following is a (non-exhaustive) list of major types of Morbidity/Disability risks that can be pursued on similar to life technical bases:

a. Sickness;

b. Accident at work/occupational disease while employed and post-employment (particularly with respect to occupational disease);

c. Critical illness, specifically tied to benefit availability dependent on surviving a specified period of time following confirmation of diagnosis;

d. Disability, including temporary and permanent, temporary and full, physical and non-physical (mental);

e. Loss of income, including past and future income and includes (but not limited to) salary replacement;

f. Long-term care – all forms of insurance that address full or partial loss of ability to perform all defined and established functions of daily living;

g. Health insurance – medical and directly related expenses; and

h. Health insurance – other than medical and directly related expenses such as preventative health and wellness benefits.

Example

Segmentation of a classic health insurance product (no levelling of premiums) with a morbidity benefit

• If the health insurance liabilities are calculated on the basis of claims triangles or unearned premiums, this liability should be classified into a non-life segment. If the morbidity liability calculations are based on a morbidity/disability table, then this liability should be classified into a life segment.

• If the insurance liability calculation methodology changes after the occurrence of an event in order to reflect the evolution of the underlying risk, the segmentation should reflect this evolution.

Example

Segmentation of a disability product:

• The disability liability should be classified into a non-life segment during the period in which the policyholder does not have a declared disability, if the insurance liability calculation methodology is based on claims triangles or unearned premiums.

• If the insurance liability calculation methodology changes when a policyholder declares a disability and takes into account biometric variables from that moment, this disability liability should be classified into a life segment after the occurrence of the claim.

Example

Segmentation of morbidity and disability products where the insurance liability calculation is based on loss ratios:

• The morbidity or disability liability should be classified into a non-life segment if the determination of the loss ratio was based on non-life techniques such as claims triangles.

• The morbidity or disability liability should be classified into a life segment if the determination of the loss ratio was based on life techniques such as morbidity/disability tables.

5.2.2.3.2 Sub-risks to be covered

a. Category 1: Medical expenses

- Typical examples are medical expense / supplemental medical contracts that provide benefits for practitioner fees, medication fees, vision and dental expenses, etc.

b. Category 2: Lump sum in case of a health event

- Typical examples are accident, critical illness, and permanent disability policies that provide a lump sum payment on occurrence of a claim. This category also generally includes accidental death and dismemberment policies.

c. Category 3: Short-term recurring payments

- Typical examples are hospital indemnity, personal accident / loss of income policy, short-term disability income protection (generally in the context of group insurance).

d. Category 4: Long-term recurring payments

- Typical examples are personal or group policies for permanent disability and long-term care.

21. The typical examples provided above are indicative and are not meant to be exhaustive. The terminology may also vary across jurisdictions.

Example

- Short-term recurring payments with long contract term (Category 3):

  Medical benefit products with a 10-year renewal or whole life term that provide hospitalisation benefits are typically categorised as short-term recurring payments with long contract term.

- Long-term recurring payments with short contract term (Category 4):

  Group disability contracts that are typically one year in duration but for which the associated benefits could continue to be paid to individuals until age 65 or 70.

5.2.2.3.3 Calculation

[No explanatory text in this section]

5.2.2.4 Lapse risk

22. Legal or contractual options to take into account in the calculation of the Lapse risk charge include options to partially or fully terminate, surrender, renew, extend, reduce or increase insurance coverage as well as the reduction or suspension of premium payments and changes in take up rates of options such as annuitisation options.

5.2.2.4.1 Level and Trend component

23. Options that allow for a reduction in insurance coverage (eg options to partially or fully terminate cover) will be affected by the increase (decrease) in take-up rates. Where an option allows for an increase (decrease) in insurance cover (eg extension of cover), the X% increase (decrease) should be applied to the rate that would apply if the option is not taken up (ie not exercised). In the case of an increase, the resulting shocked lapse rate should not exceed 100%, ie $\min\left[100\%, (1+X\%) \times base\ option\ takeup\ rate\ assumptions\right]$. In the case of a decrease, the resulting shocked lapse rate should be floored at 0%, ie $\max\left[0\%, (1-X\%) \times base\ option\ takeup\ rate\ assumptions\right]$.

Example for Level and Trend component

The following example illustrates how results should be aggregated in a given Region A, assuming that there are only two homogeneous risk groups for Region A

		Pre-stress NAV				
		Assets (a)	PV Benefits (b)	PV Expenses (c)	PV Premiums (d)	Current Estimate (e)=(b)+(c)-(d)
Homogenous Risk Group 1	Base	100	200	20	150	70
Homogenous Risk Group 2	Base	80	100	10	50	60
Total		180	300	30	200	130

Base NAV for Region A=(100-70)+(80-60)=50

		Post stress NAV (net of reinsurance and without the impact of management actions)				
		Assets (a)	PV Benefits (b)	PV Expenses (c)	PV Premiums (d)	Current Estimate (e)=(b)+(c)-(d)
Homogenous Risk Group 1	Upward stress	100	150	10	100	60
	Downward stress	100	220	30	160	90

Homogenous Risk Group 2	Upward stress	60	80	10	40	50
	Downward stress	80	110	20	70	60

Assuming no impact of management actions

		Post stress NAV (net of reinsurance and with the impact of management actions)				
		Assets	PV Benefits	PV Expenses	PV Premiums	Current Estimate
Homogenous Risk Group 1	Upward stress	100	150	10	100	60
	Downward stress	100	220	30	160	90
Homogenous Risk Group 2	Upward stress	60	80	10	40	50
	Downward stress	80	110	20	70	60

Post stress NAV for Group 1 = Min(100-60,100-90)=10 (downward stress resulted in larger drop in NAV)

Post stress NAV for Group 2 = Min(60-50, 80-60)=10 (upward stress resulted in a larger drop in NAV)

Lapse risk (Level and Trend component) to be reported for Region A

		Pre-stress NAV	Post stress NAV without the impact of management actions	Risk charge without the impact of management actions	Credit for exercising management actions	Risk charge with the impact of management actions
Region		50	20	30	0	30

5.2.2.4.2 Mass Lapse component

[No explanatory text in this section]

5.2.2.5 Expense risk

24. The Expense risk charge covers both unit expense risk and expense inflation risk.

25. Unit expense risk is the risk of adverse change in the value of qualifying capital resources due to unexpected changes in the level of expenses incorporated within the insurance liabilities. Such expenses would include administrative and overhead expenses, management expenses and acquisition expenses excluding commissions expected to be incurred in future.

26. Expense inflation risk is the risk of expenses increasing at a higher rate than the inflation rate assumed in the calculation of insurance liabilities due to adverse changes in factors relating specifically to the insurance sector. This risk is applicable only to life business and similar to life health business.

27. Expenses that are not subject to any estimation uncertainty are excluded from both the unit and inflation stresses. The expense inflation stress is applied only to expenses that are sensitive to inflation.

Example

For calculating the current estimate of liabilities, a global expected amount of expenses $\boldsymbol{e_t}$ is projected for each future year $\boldsymbol{t}$. This amount is split between an inflation-sensitive amount $\prod_{s=1}^{t}(\mathbf{1}+\boldsymbol{i_s})\,.\,\boldsymbol{eis_t}$ (where $\boldsymbol{i_s}$ is the expected future inflation for year s), an amount $\boldsymbol{ens_t}$ that is not sensitive to inflation and an amount $\boldsymbol{ed_t}$ that is deterministic (for instance, $\boldsymbol{ed_t}$ may include commissions based on a contractually determined percentage of future fixed premiums).

After stress, the amount of expenses for year $\boldsymbol{t}$ should be calculated as:

$$\widetilde{\boldsymbol{e_t}} = \boldsymbol{ed_t} + (\mathbf{1}+\boldsymbol{x})\left[\prod_{s=1}^{t}(\mathbf{1}+\boldsymbol{i_s}+\boldsymbol{y_s})\,.\,\boldsymbol{eis_t} + \boldsymbol{ens_t}\right]$$

where $\boldsymbol{x}$ and $\boldsymbol{y_s}$ are the risk factors specified in paragraph L2-166.

5.2.3 Calculation of Non-life risk charges

5.2.3.1 Segments/Lines of business

[No explanatory text in this section]

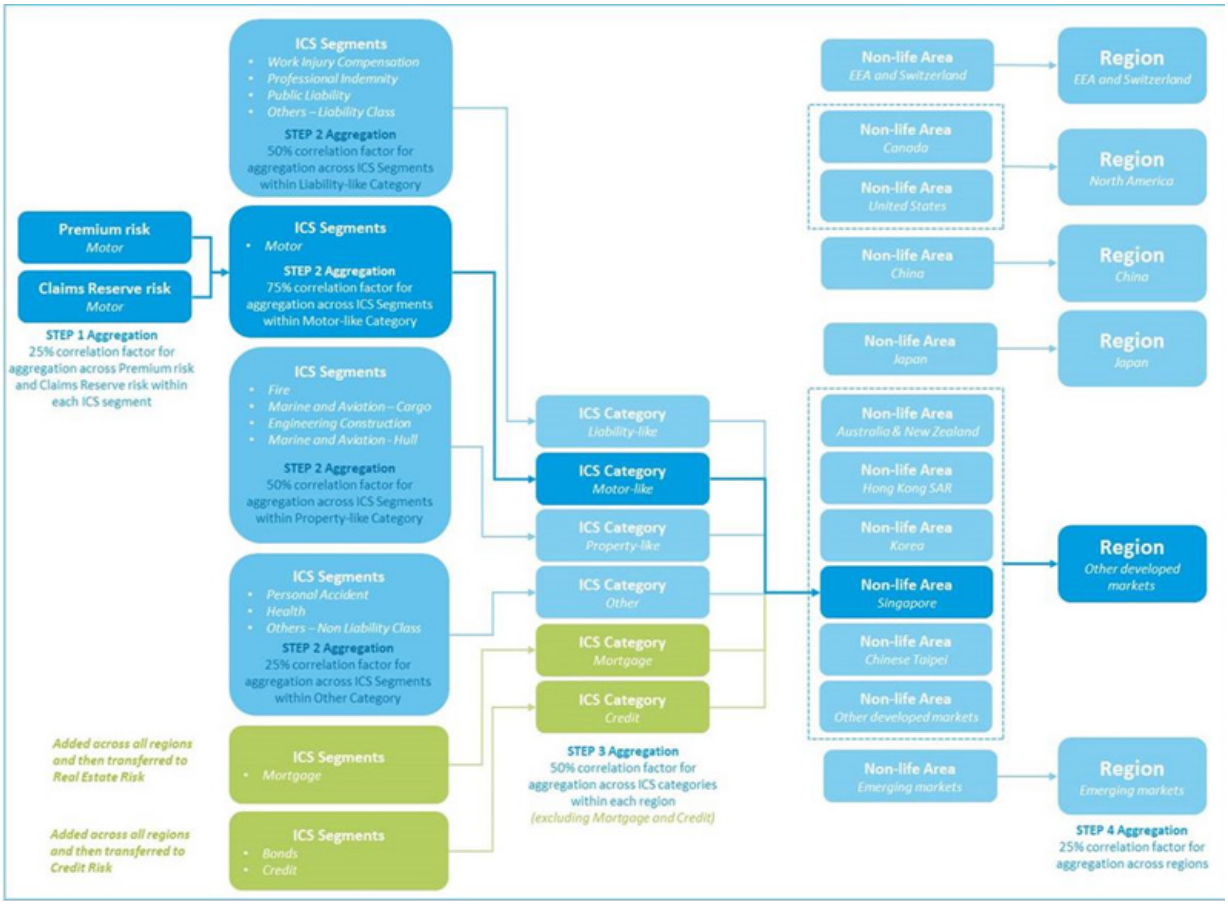
5.2.3.2 Definition of ICS Segments and Risk Charges

[No explanatory text in this section]

5.2.3.3 Aggregation

[No explanatory text in this section]

Figure 4: Categorisation of non-life risk exposure, showing how Singapore Motor-like ICS Category is aggregated



5.2.3.4 Input data required

5.2.4 Calculation of Catastrophe risk charges

5.2.4.1 Scope of calculation

28. When calculating the Catastrophe risk charge, all lines of business exposed to Catastrophe risk are considered. For example, a natural catastrophe such as an earthquake could impact not only the residential property, commercial property, auto and marine (incl. energy offshore) lines of business, but also specie/fine art, personal accident, aviation, liability, workers' compensation and some life or health insurance lines of business.

29. Before performing a detailed calculation, IAIGs should assess the materiality of the impact of catastrophe events based on their contractual exposure to the perils and scenarios listed. If it is determined that possible exposure to a specific scenario is immaterial, then a detailed calculation is not required.

5.2.4.2 Covered perils

30. The impact of catastrophe claim events include both the main peril and any secondary perils associated with the main peril. Secondary perils can affect all lines of business within the scope of the calculation. For example, the main peril tropical cyclone may cause secondary perils such as storm surge and events such as dam breaking as well as demand surge or loss amplification. Similarly, fire or tsunami following an earthquake, sprinkler leakage and demand surge or loss amplification should be associated with the earthquake scenario, as appropriate.

5.2.4.3 Natural catastrophe

5.2.4.4 Other catastrophe scenarios

5.2.4.4.1 Terrorist attack

31. Fatalities and disabilities should only take into account liabilities from insurance contracts (eg life and health insurance policies). In particular, liabilities to own staff not originating from insurance contracts (eg through benefits or other forms of exposure) should not be included. For life insurance liabilities for which the geographical location is not available, IAIGs should make a best effort estimation of the concentration of exposures considering, in particular, group policies.

5.2.4.4.2 Pandemic

[No explanatory text in this section]

5.2.4.4.3 Credit and Surety

5.2.4.4.3.1 Mortgage insurance

32. In implementing the stress scenario and to account for differences in risk profiles across various exposures and activities, portfolios and business activities are segmented into categories based on common or related risk characteristics. Appropriate models should be used to translate the relevant risk factor (home price decline) into the financial impact (increased losses). Where applicable, those models that the IAIG already uses to calculate stress losses, premium deficiency reserves or other loss measures should be used.

5.2.4.4.3.2 Trade credit

33. To help approximate these total loss amounts, IAIGs should first calculate their aggregate net earned premium for trade credit by external credit rating category: investment grade vs. non-investment grade. Then the following factors are applied to net premiums earned in the past year by rating category. Considering that the scenario does not require the identification of specific defaulting customers, the factors should be applied to the net premium earned as a way to reflect the impact of reinsurance. No further adjustment for reinsurance protection (eg non-proportional reinsurance) is required to calculate the loss amount.

34. The investment grade and non-investment grade categories are determined using the current rating of the policyholder's customers (if available). If a customer is not rated, the IAIG may use its internal rating system or assume it is non-investment grade.

35. If the IAIG is not able to apply the above factors due to internal data limitations, the company should apply a stress loss ratio equal to the worst experience that occurred between 2008 and 2010 to the net earned premium for trade credit.

5.2.4.4.3.3 Surety

36. The net potential loss amount for a principal is calculated using the gross exposure of the principal (after any contractual amortisation that has occurred). The loss severity model 95% probable maximum loss (PML) factor is applied to the gross exposure. For US exposures, the loss severity model 90% PML for each principal can be calculated using the most current construction loss severity model developed by the Surety & Fidelity Association of America. For non-US exposures, a loss severity model 95% PML worst gross loss to exposure ratio for the past 10 years in that country or for that exposure type is used, whichever is the most granular. The loss amount is then adjusted for any co-surety arrangements, acceptable cash collateral (currently in the custody of the IAIG) and any reinsurance arrangements.

37. The co-surety amount and the adjustment for reinsurance are calculated using existing terms of the surety exposure. Adjustments can only be made for cash collateral already in custody with the IAIG or in a trust for which the IAIG is a beneficiary.

Example of Credit stress for surety

	Loss calculation	Surety Exposure
1	Gross Exposure for Principal	10,000,000
2	Loss Severity Model 95% PML Factor	0.4
3	Loss Severity Model 95% PML Amount = (1) * (2)	4,000,000
4	Adjustment for co-surety (co-surety % * (3))	400,000
5	Net PML Amount after Co-surety = (3) - (4)	3,600,000
6	Acceptable cash collateral	100,000
7	Net PML amount = (5) - (6)	3,500,000
8	Adjustment for reinsurance	50,000
9	Net potential Loss amount	3,450,000

5.2.4.5 Aggregation of Catastrophe risks

[No explanatory text in this section]

5.2.4.6 Calculation of the recoverable amount to be used for the calculation of contingent Credit risk

38. The approach is illustrated by the following example. For simplicity, it is assumed that the terrorist attack scenario is the only other catastrophe scenario and therefore the Catastrophe risk

charge is the square root of the sum of the square of the Natural Catastrophe risk charge and the Terrorist Attack risk charge.

Example

		Natural catastrophe	*Terrorist attack*	*Catastrophe risk charge*
Gross Loss: A	ICS RC	150	50	158
Reinsurance recoverable				
Recovery 1: B1	1	20	10	
Recovery 2: B2	1	20	10	
Recovery 3: B3	2	10	5	
Net loss: C = A - B1 - B2 - B3		100	25	103
Recoverable amount: D= A - C				55

All recoverable in ICS RC 1: B1 + B2	40	20	60
All recoverable in ICS RC 2: B3	10	5	15
% recoverable in ICS RC 1 : E1 = (B1 + B2) / (B1 + B2 + B3)			80%
% recoverable in ICS RC 2 : E2 = B3 / (B1 + B2 + B3)			20%
Total recoverable amount = D			55
Recoverable in ICS RC 1: D * E1			44
Recoverable in ICS RC 2: D * E2			11

5.2.4.7 Safeguards for natural catastrophe models

Safeguard 1

[No explanatory text]

Safeguard 2

39. Validation should enable IAIGs to better understand the capabilities and limitations of the natural catastrophe model and confirm that the natural catastrophe model and the supporting processes are adequate and appropriate for the purpose. Validation should be an iterative process by which IAIGs using a natural catastrophe model periodically refine validation tools in response to changing market and operating conditions. There is no universal validation method, and the structure of the validation approach depends on the technical specifications of the natural catastrophe model, its purpose and its intended use. When local regulations explicitly specify that a natural catastrophe model may be used for the calculation of insurance liability or premium rates, and the GWS verifies

or requires the IAIG to demonstrate that the model appropriately reflects the risk characteristics of the IAIG, this safeguard is satisfied provided that the IAIG demonstrates its understanding of the capabilities and limitations of the model.

40. Validation should encompass both quantitative and qualitative elements. While it might be possible to think of validation as a purely technical/mathematical exercise in which outcomes are compared to estimates using statistical techniques, it is insufficient to focus solely on comparing predictions to outcomes. In assessing the overall performance of a natural catastrophe model, it is important to assess the overall model and each of its building blocks regarding the structure, governance, data and processes.

41. Finally, to achieve an effective validation, an objective challenge is essential. Independent model validation helps the IAIG evaluate and verify the overall performance of their natural catastrophe model. Proper independence of the validation function is therefore important, whether the validation is internal or external, and individuals performing the validation must possess the necessary skills, knowledge, expertise and experience.

Safeguard 3

42. Senior management should have a certain level of engagement concerning the natural catastrophe models as part of the use test, which will be further detailed in the section on Safeguard 5.

Safeguard 4

43. The statistical quality test concentrates on the individual building blocks of a natural catastrophe model. The different elements making up the natural catastrophe model and the inputs used must pass this test.

44. The statistical quality test also sets the boundaries within which IAIGs should take responsibility for specifying their approach to assess and aggregate risks. In conjunction with natural catastrophe model validation requirements, the statistical quality test promotes a well-structured, documented and controlled process of model development and refinement which should be consistently applied across the IAIG, including the different modelling areas.

45. Data used to build the natural catastrophe model are one of the main drivers of its performance. Natural catastrophe models need high-quality data in order to produce sufficiently reliable results. The data used for a natural catastrophe model should be current and sufficiently credible, accurate, complete and appropriate. Hence, a ‘statistical quality test’ should examine the appropriateness of the underlying data used in the construction of the natural catastrophe model. Any data not specific to the insurer would need to be carefully considered before deciding if it is appropriate for use as the basis for an insurer's ‘statistical quality test’. Even where deemed appropriate, it may still be necessary to adjust the data to allow for differences in features between the data source and the insurer.

46. The statistical quality test should include future projections within the model and, to the extent practicable, ‘back-testing’ (the process of comparing the predictions from the model with actual experience).

47. When local regulations explicitly specify that a natural catastrophe model may be used for the calculation of insurance liability or premium rates, and the GWS verifies or requires the IAIG to

demonstrate that the model appropriately reflects the risk characteristics of the IAIG, this safeguard is satisfied provided that the IAIG is able to effectively demonstrate the validity of the assumptions set by the IAIG itself, including input data, expert judgment and the impact of risk mitigation and future management actions, etc.

Safeguard 5

48. The IAIG should demonstrate that its natural catastrophe model is widely used and plays an important role in risk management and decision-making, at different levels of management in the organisation, and the assessment of the economic and solvency capital.

49. The IAIG provides evidence that the natural catastrophe model is fully embedded in its operational and organisational structure and demonstrate that the model remains useful and is applied consistently over time.

50. Furthermore, the IAIG should demonstrate to its GWS that a natural catastrophe model used for regulatory capital purposes remains useful and is applied consistently over time and that it has the full support of and ownership by the senior management.

51. Another key aspect of the use test is that the IAIG's senior management is responsible for the design and implementation of the natural catastrophe model and for ensuring the ongoing appropriateness of the model.

52. For a model to pass the use test it is expected that an insurer has a framework for the model's application across business units. This framework should define lines of responsibility for the production and use of information derived from the model.

53. When local regulations explicitly specify that a natural catastrophe model may be used for the calculation of insurance liability or premium rates, and the GWS verifies or requires the IAIG to demonstrate that the model appropriately reflects the risk characteristics of the IAIG, this safeguard is satisfied.

Safeguard 6

54. This documentation should include the design, construction and governance of the natural catastrophe model, including an outline of the rationale and assumptions underlying its methodology.

55. The documentation should be thorough, detailed and complete enough to be sufficient for a knowledgeable professional in the field to be able to understand its design and construction. This documentation should include justifications for and details of the underlying methodology, assumptions and quantitative and financial bases, as well as information on the modelling criteria used to assess the level of capital needed.

56. The insurer should also document, on an ongoing basis, the development of the model and any major changes, as well as instances where the model is shown to not perform effectively. Where there is reliance on an external vendor/supplier, the reliance should be documented along with an explanation of the appropriateness of the use of the external vendor/supplier.

57. IAIGs should properly document natural catastrophe model changes and notify their GWS of material changes to the natural catastrophe model. IAIGs should also report information necessary for supervisory review such as, but not limited to, the identification and characteristics of the models used, information on the risk profile and natural catastrophe risks to which the IAIG is exposed,

justification of the choice of a particular model over others, information on the way the model has been used (eg adjustments made), and some restrictions, if any, to the way the models have been used (eg regarding the use of some options or parameters provided by vendor models, and/or regarding potential adjustments).

Safeguard 7

58. IAIGs should list natural catastrophes they face and identify which are not modelled in their natural catastrophe models, as well as those that are modelled. IAIGs should also justify the reason why these natural catastrophes are not modelled and assess the impact of these natural catastrophes, and report to their GWS, if necessary. IAIGs should have an iterative process of reviewing this list to demonstrate that the model remains useful and is applied consistently over time.

5.3 Market risks

5.3.1 Calculation of the Market risk charge

[No explanatory text in this section]

5.3.2 Interest Rate risk

[No explanatory text in this section]

5.3.3 Non-Default Spread risk

[No explanatory text in this section]

5.3.4 Equity risk

[No explanatory text in this section]

5.3.5 Real Estate risk

[No explanatory text in this section]

5.3.6 Currency risk

[No explanatory text in this section]

5.3.7 Asset Concentration risk

[No explanatory text in this section]

5.4 Credit risk

5.4.1 Calculation of the Credit risk charge

5.4.1.1 Exposure classes

[No explanatory text in this section]

5.4.1.2 Distribution of exposures by maturity

[No explanatory text in this section]

5.4.1.3 Reinsurance exposures

[No explanatory text in this section]

5.4.1.4 Off-balance sheet exposures

5.4.1.4.1 Credit equivalent amount for OTC derivatives

59. The calculation of Net to Gross Ratio (NGR) can be made on a counterparty by counterparty basis or on an aggregate basis for all transactions subject to legally enforceable netting agreements. On a counterparty by counterparty basis, a unique NGR should be calculated for each counterparty. On an aggregate basis, one NGR should be calculated and applied to all counterparties.

5.4.1.4.2 Credit equivalent amount for other off-balance sheet exposures

[No explanatory text in this section]

5.4.1.5 Securities financing transactions

[No explanatory text in this section]

5.4.1.6 Credit risk stress factors

[No explanatory text in this section]

5.4.1.7 Mortgage Loans

[No explanatory text in this section]

5.4.2 Recognition of collateral, guarantees and credit derivatives

[No explanatory text in this section]

5.4.3 Use of external credit ratings

[No explanatory text in this section]

5.5 Operational risk

60. Non-Life insurance products include auto/motor, property, workers' compensation/employer's liability, other liability, and credit/ surety/pecuniary.

61. Life (risk) insurance products include individual life, group life, group pension and annuities (with a life aspect).

62. Life (non-risk) products may be labelled as savings without guarantees or living benefits.

5.6 Aggregation / diversification of ICS risk charges

[No explanatory text in this section]

5.7 Non-insurance risk charges

[No explanatory text in this section]

6 Tax

6.1 General principles

Example: G-ETR calculation

An insurance group consists of the following entities located in different jurisdictions:

- Entity A: Insurance entity in country X
- Entity B: Insurance entity in country Y
- Entity C: Reinsurance entity in country Z
- Entity D: Banking entity in country Z

		GAAP Earnings before tax		
Group entities	Effective tax rate	FY2016	FY2017	FY2018
Entity A	30%	500	700	-200
Entity B	25%	1,000	-100	900
Entity C	20%	2,000	500	1,500
Entity D	20%	200	500	300

- GAAP losses for Entity A in FY2018 and Entity B in FY2017 should be floored at zero.
- Entity D conducts non-insurance related activities, and should be excluded from the G-ETR calculation.

The G-ETR for this insurance group:

$$\frac{30\% * (500 + 700 + 0) + 25\% * (1{,}000 + 0 + 900) + 20\% * (2{,}000 + 500 + 1{,}500)}{7{,}100} = 23.03\%$$

6.2 Deferred tax resulting from the ICS Adjustment

6.2.1 Utilisation assessment of DTAs recognised from the ICS Adjustment

[No explanatory text in this section]

6.3 Tax effect on the ICS insurance capital requirement

Example: Utilisable tax effect on the ICS insurance capital requirement calculation

An insurance group has insurance-related activities in the US, UK, Korea and Japan and does not apply a fiscal unity:

- Insurance capital requirement: 10,000
- G-ETR: 30%
- Notional tax effect on the insurance capital requirement: 3,000 (10,000 * 30%)
- DTA on ICS balance sheet: 300 (insurance activities 250, non-insurance activities 50)
- DTL on ICS balance sheet: 850 (insurance activities 700, non-insurance activities 150)

Component a: tax loss carry-backs

	US	UK	Korea	Japan	Total
GAAP insurance liabilities	8,000	2,000	6,000	4,000	20,000
a. Allocated notional tax effect on insurance capital requirement	1,200	300	900	600	3,000
b. Maximum tax loss carry back	100	1,000	n/a	n/a	1,100
Limited maximum tax loss carry back before the 15% deduction (min (a,b))	100	300	n/a	n/a	400

Tax loss carry backs for the utilisation assessment: 340 = 400 * (1-15%)

Component b: post-stress future taxable income projections

- Total of the last five years of consolidated GAAP earnings before tax: 8,000
- IAIG acquired an entity during the five-year period. Earnings before tax of the entity at the beginning of the period before being acquired: 100

Post-stress future taxable income projection from insurance business for the utilisation assessment: 1,215 = (8,000+100) * 30% * 50%

Components c and d: deferred taxes

Net deferred tax liability for insurance activities: 450 = max (0, 700-250)

Net deferred tax asset for insurance activities: 0 = max [0, min (15% * 10,000, 250 - 700)]

Utilisable tax effect on the ICS insurance capital requirement calculation:

Tax loss carry backs (340) + post-stress future taxable income projections (1,215) + Net DTL for insurance activities (450) – Net DTA for insurance activities (0) = 2,005

Utilisable tax effect on the insurance capital requirement: 2,005 = min (80% * 3,000, 2,005)

7 Capital requirement – Other Methods

7.1 Supervisor-owned and controlled credit assessments (SOCCA)

63. IAIGs that are able to use NAIC Designations should calculate and report the Credit risk charges using the following mapping table, for unrated exposures. The mapping table has been updated from the 2022 data collection exercise to reflect the broader range of NAIC designations that became effective as of year-end 2021, and now includes the designation modifiers (A-G) for exposures in category 1. Each designation has been mapped to the most relevant ICS rating category.

Table 1: Mapping of NAIC Designations to ICS RC in 2024

NAIC Designation	ICS RC
1A	1
1B-D	2
1E-G	3
2	4
3	5
4	6
5	7

7.2 Internal models

7.2.1 Reporting of internal model data

7.2.1.1 Internal model required capital

[No explanatory text in this section]

7.2.1.2 Internal model required capital (using own classification of risks)

[No explanatory text in this section]