

Multinational



**INTERNATIONAL ENERGY INSURANCE PLC
FINANCIAL CONDITION REPORT AS AT 31
DECEMBER 2022**

Table of Contents

EXECUTIVE SUMMARY	1
INTRODUCTION, PURPOSE AND LIMITATIONS	2
BUSINESS OVERVIEW	3
ASSET LIABILITY MATCHING	6
FINANCIAL CONDITION AS AT 31 DECEMBER 2022	8
SOLVENCY PROJECTIONS	9
ECONOMIC CAPITAL.....	12
CONCLUSION AND RECOMMENDATIONS	15
APPENDIX 1: RELIANCE & LIMITATIONS	17
APPENDIX 2: ECONOMIC CAPITAL RESULTS AT 95% CONFIDENCE LEVEL.....	18
APPENDIX 3: ECONOMIC CAPITAL METHODOLOGY & STRESS LEVEL DERIVATION	20
APPENDIX 4: CORRELATION MATRICES.....	27

EXECUTIVE SUMMARY

This report provides an overview of the Financial Condition of International Energy Insurance (IEI) (hereinafter referred to as “the Company”) as at 31 December 2022.

We understand that this report will form part of the Company’s submission to NAICOM. The report has been prepared in accordance with the Guidance Notes for General Insurance Business – Actuarial Reports (GN12v5.0) published by the Institute and Faculty of Actuaries to meet professional standards and best international practices.

The following are the key conclusions of the report;

- As at 31st December 2022, the business had a Net Asset Value (NAV) of -N12.15 billion which is -405% of the statutory minimum capital of N3 billion. The NAV deteriorated by 4% from -N11.65 billion recorded for the financial year ending 31 December 2021. However, the business is still under-capitalized from the current regulatory point of view.
- We estimate the economic/risk-based capital required to support the business as at 31st December 2022 as N6.11 billion.
- The shareholder Funds of -N12.15 billion is -50% of the Economic Capital. This implies that some policyholder liabilities will not be met as and when they arise since the company is undercapitalised.
- The business experienced a 10% decrease in expense ratios from, 24% in 2021 to 14% in 2022. These ratios are based on directly attributable expenses. However, it also important that the company continue to employ strategies to contain the overall expenses of the business i.e., expenses that are not directly attributable included.
- We have also noted that the company’s combined ratio stood at 53% as at 31 December 2022. Management must continue to manage its underwriting practices, claims, and expenses management to ensure robust profits.

INTRODUCTION, PURPOSE AND LIMITATIONS

We are pleased to present our Financial Condition Report (“FCR”) for International Energy Insurance as at 31st December 2022.

Purpose

This report sets out the outcome of our assessment of the criteria stipulated in the Guidance note (GN12v5.0), issued by the Institute and Faculty of Actuaries and to the extent relevant to International Energy Insurance for the year ended 31st December 2022.

This report is prepared solely to provide an overview of the current financial condition of the Company. We understand that this report will form part of your submission to NAICOM. This report is not to be used for any other purpose other than that described above and should not be distributed to any other parties other than NAICOM.

Limitations

Management is solely responsible for the contents and submission of the Financial Conditions Report in accordance with Guidance Note GN12V5.0

Our report has been prepared based on certain assumptions and is subject to certain limitations. These have been described in Appendix 1 - Reliance and Limitations.

BUSINESS OVERVIEW

Premium History

As shown in the table below, the company experienced a growth rate of 29% over the 2021-2022 period.

Line of Business	2020		2021		2022	
	N' 000	%	N' 000	%	N' 000	%
Fire	23 475	4.16%	15 589	2.27%	21 099	2.39%
Accident	13 623	2.41%	28 397	4.13%	30 367	3.44%
Motor	503 424	89.17%	596 160	86.77%	785 441	89.10%
Bonds	0	0.00%	300	0.04%	200	0.02%
Marine	24 046	4.26%	46 630	6.79%	44 451	5.04%
Oil & Energy	0	0.00%	0	0.00%	0	0.00%
Total	564 568	100.00%	687 076	100.00%	881 559	100.00%
% Increase (YoY)	7.00%		22.00%		28.00%	

The increase in IEI's gross premiums for FY2022 is largely attributable to the Motor line of business which grew by 33% i.e. from N 591.34 million to N 784.625 million. Given the growth in premium over the period, IEI should closely monitor its underwriting practices to ensure it can cater for the increase in exposure that comes with expanding its business. This is essential in ensuring business sustainability, profitability, and compliance with the regulatory requirements amidst increased business activities and helps protect the insurer against potential future losses that could arise from uncontrolled expansion.

Contribution to Profit

We illustrate in the table below how premium income has been “utilised” from 2020 to 2022.

	2020	2021	2022
	N'000	N'000	N'000
Net Premium Income (NPI)	439 995	543 357	668 772
Net Written Premium	449 934	567 299	686 034
Net Claims Incurred	69 510	232 405	134 088
Total Expenses	1 456 139	807 065	933 032
Investment Income	45 393	20 340	24 295
Claims Ratio	15%	44%	20%
Expense Ratio	61%	24%	14%
Commission Ratio	4%	15%	3%
Combined Ratio	81%	82%	37%
Investment Income (% NPI)	10%	4%	4%
Contribution to Profit (%NPI)	29%	22%	67%

We illustrate in the table above that the claims ratio has been in the 14%-44% range over the 3 years. Typically, a claims ratio between 40% and 60% is deemed acceptable.

The expense ratio based on directly attributable expenses ranged between 14% and 34%.

Definitions

Metric	Definition
Claims Ratio	Net Claims Expenses/ Net Premium Income
Expense Ratio	Directly Attributable Expenses / Net Written Premium
Combined Ratio	Claims Ratio + Expense Ratio
Investment Income (%NPI)	Investment Income / Net Premium Income

Contribution to Profit

Investment Income + (100% - Combined Ratio)

We illustrate below the company's return on equity (including dividend income) as published in the Annual Financial Statements. The return on equity has been consistently lower than the risk-free rate. We advise that the company targets average returns over a rolling period (e.g., 3 years) to exceed Treasury Bill rates to reward shareholders for the risk they have undertaken.

At the time of this Financial Condition Report we were provided with the Annual Financial Statements as at 31 December 2022.

Year	Shareholders Fund	Return on Equity (as published in the Accounts)
	N'000	%
2020	(11 075 790)	6%
2021	(11 845 368)	6%
2022	(12 339 839)	1%

Distribution Channel

With the increased use of digitalization in Nigeria, we advise IEI to utilize this as an avenue to become more customer-centric and reduce overdependence on brokers for writing business.

ASSET LIABILITY MATCHING

Balance Sheet Solvency

We illustrate in the table below that the company at each year-end under review has Shareholders' Funds below the Insurance Funds (Policyholders' Liabilities). We observe that the Balance Sheet Solvency in 2022 improved to -251%, from -278%.

Year	2020 (N'000)	2021 (N'000)	2022 (N'000)
Technical Liabilities (Insurance Fund)	4 110 675	4 265 090	4 923 297
Shareholders Fund (Free Assets)	(11 075 790)	(11 845 368)	(12 339 839)
Balance Sheet Solvency Ratio	- 269%	- 278%	-251%

These negative solvency ratios indicate financial distress implying the company might not be able to meet its liabilities as and when due.

We highlight the regulatory solvency position below and discuss risk-based solvency in section 6.

Regulatory Solvency

We show in the table below that the company's admissible assets were below the regulatory capital requirement of N3 billion throughout the 3 years under review.

Year	2020 (N'000)	2021 (N'000)	2022 (N'000)
Free Assets (allowing for admissible rules)	-10 839 780	-11 648 307	-12 148 398
Minimum Capital Requirement		3 000 000	3 000 000
Capital Adequacy Ratio (CAR)	-361%	-388%	-405%

Definition

Metric	Definition
Capital Adequacy Ratio (CAR)	Free Assets/Minimum Capital Requirement
Balance Sheet Solvency Ratio	Shareholders' Funds/Technical Reserves

Stress Scenario for 2022 Results

We illustrate the stressed solvency margin for 2022 after applying a 20% ratio on the ultimate loss ratio in the table below.

Year	2022 (N'000)	2022 - Stressed (N'000)
Technical Liabilities	5 723 480	4 923 296
Shareholders Fund (Free Assets)	-12 948 582	-12 148 398
Balance Sheet Solvency Ratio	-226%	-247%

The above table demonstrates that the solvency ratio would be immaterially impacted should the claim ratio increase by 20% as the balance sheet solvency has worsened.

FINANCIAL CONDITION AS AT 31 DECEMBER 2022

We have illustrated above that the company is under-capitalized on both;

- balance sheet basis and
- Statutory admissible amount basis.

The current solvency position puts the company at risk of failing to meet policy holders' liabilities as incurred.

However, the company has put in place structures to improve the solvency.

We advise that the company:

- Relies more on equity financing or short-term borrowings with low interest rates.
- Regularly review and adjust retention levels to balance between retaining profitable business and minimizing risk exposure.
- Invest in high-quality securities that provide stable returns and are easily liquidated in times of need.

SOLVENCY PROJECTIONS

The Projection Process

We have projected the income statements for each of the years 2023 and 2024 assuming claim and expense patterns to date, continuing into the future, and adopting the premiums projected for each of the years.

The exercise led to projected technical liabilities at the end of each year and a corresponding balance sheet. We have assumed that new money accruing into the fund will be invested in money market instruments.

We report our projected solvency ratios herein, we have also stressed these ratios in anticipation of adverse events and commented accordingly.

Data and Assumptions

The most recent portfolio status and the corresponding valuation dataset formed the bases of the projection.

Projections of technical reserves i.e., outstanding claims and unexpired premium reserves are based on the projected sales volume and the historical information at our disposal. The target sales volume information (as detailed in Section 7.1) was provided by the Company.

The unexpired premium reserves were projected for each line of business assuming risk would occur uniformly throughout the year.

The outstanding claims reserves were projected using the projected claims settlement patterns as determined in the most recent valuation exercise.

Projections results

The following results show the 2023 and 2024 projections.

INCOME STATEMENT	2023 (N'000)	2024 (N'000)
Gross Written Premium	1 050 080	1 250 815
Gross Premium Income	945 049	1 170 371
Reinsurance Cost	(100 687)	(107 469)
Net Premium Income	844 361	6 770 688
Commission income	22 648	29 715
Net Underwriting income	867 010	6 849 944
Net claims incurred	(842 388)	(1 636 564)

Underwriting expenses	(184 483)	(200 124)
Other underwriting expenses	(1 026 872)	(2 324 911)
Investment income	950 043	1 213 433
Management Expenses	(801 048)	(860 398)
Profit before income tax	572 782	2 320 361
Finance cost	(444 367)	(330 230)
Derecognition of interest	0	0
Profit/(Loss) before income tax	0	0
Income tax expenses	(8 200)	(7 571)
Profit for the year after tax	120 215	1 982 560

The following shows the 2023 and 2024 projections for the balance sheet.

ASSETS & LIABILITIES	2023 (N'000)	2024 (N'000)
TOTAL ASSETS	19 618 834	29 264 040
Liabilities		
Technical Reserves	5 252 792	5 726 675
Trade payables	426 387	1 272 193
Other payables	24 853 510	29 317 486
Total Liabilities	30 532 689	36 316 354
Share capital	642 043	642 043
Contingency reserves	1 652 096	1 681 761
Other reserves	11 421 832	13 271 149
Retained earnings	(24 629 826)	(22 647 266)

Shareholder's equity	(10 913 855)	(7 052 314)
Total liabilities and shareholder's equity	19 618 834	29 264 040

The projected solvency margins are as shown below:

Year	2023 (N'000)	2024 (N'000)
Technical Liabilities	5 252 792	5 726 675
Shareholders Fund (Free Assets)	-10 913 855	-7 052 314
Solvency Margin	-208%	-123%

ECONOMIC CAPITAL

The technical figures (technical liabilities, reinsurance assets, etc.) estimated for balance sheet purposes are our 'best' estimate and broadly reflect the 'mean' of possible outcomes and include a risk adjustment in line with IFRS 17. However, over time, these estimates may fluctuate adversely as a result of unexpected realities.

It is prudent and best practice to estimate the extent to which the best estimate can be exceeded due to possible adverse situations and establish the corresponding risk capital, called ECONOMIC CAPITAL.

The key risks the company is exposed to are underwriting risk, market risk, counterparty risk and operational risk, they are described and discussed in appendix 3 of the report.

We have calculated for each of the risks, the amount of capital required as at year-end 2022 at 95% and 99.5% level of confidence.

This report discusses in detail capital requirements at 99.5%, which is equivalent to a 1-in- 200 event. Put differently, this is the capital required to sustain the company should extreme events that are expected to occur once every 200 years, occur in the future. Such events would typically lead to large 'unexpected' losses that could significantly affect the fortunes of the company. The results at 95% (1 in a 20 year event) are shown in appendix 3 of the report.

We have adopted the Solvency II approach in calculating the Economic capital.

A detailed explanation of each of the risks including derivation of the stresses applied is given in appendix 3 of the report.

To recognize that each risk event is unlikely to occur in the same year, aggregation of capital requirements was done. This has the effect of reducing the total required capital – technically called diversification. The assumed correlation matrix is shown in appendix 4.

The calculations were based on the same data used to prepare the IFRS valuation as at 31 December 2022 and asset information are shown in section 2.3 of this report.

The following results at a 99.5% confidence level were obtained.

Risk Type	Risk Type	2022 (N'000)
Non-Life Underwriting Risk	Reserve Risk	991 314
	Premium Risk	91 958
	Catastrophe Risk	35 754
	Lapse Risk	-
	SCRnl Pre-Div	1 119 027
	SCRnl Div Credit	172 425
	SCRnl Post Div	946 602
Market Risk	Interest Rate Risk	435 375
	Equity Risk	-
	Property Risk	4 173 166
	Spread Risk	-
	Currency Risk	-
	Concentration Risk	1 432 632
	SCRmkt Pre-Div	6 041 173
	SCRmkt Div Credit	1 491 798
	SCRmkt Post Div	4 549 375
Counterparty Default Risk	Reinsurance credit	44 040
	Investment credit & Debtors	1 085 305
	SCRdef Pre-Div	1 129 344
	SCRdef Div Credit	-
	SCRdef Post Div	1 129 344
Diversified BSCR	6 625 321	
Diversification Credit	686 616	

Basic SCR	5 938 705
Operational Risk	169 629
Final Economic capital	6 108 334
Shareholders' Funds	- 12 148 398
Shareholder funds as % of Economic Capital	-50%

As shown in the table above, the total Economic Capital required in connection with the business profile at 31st December 2022 was N6.11 billion, to be covered by shareholder funds of -N 12.15 billion. The shareholder funds are 150% below the Economic Capital.

This means that all the Shareholders Funds as at 31 December 2022 will be at risk during 2022 in case of adverse events.

CONCLUSION AND RECOMMENDATIONS

As at 31st December 2022, the business had a Net Asset Value (NAV) of -N12.15 billion which is -405% of the statutory minimum capital of N3 billion. The NAV deteriorated by 4% from -N11.65 recorded for the financial year ending 31 December 2021. However, the business is still under-capitalized from the current regulatory point of view.

We estimate the economic/risk-based capital required to support the business as at 31st December 2022 as N6.11 billion.

The shareholder Funds of -N12.15 billion is -50% of the Economic Capital. This implies that some policyholder liabilities will not be met as and when they arise since the company is undercapitalised.

The company's combined ratio stood at 37% as at 31 December 2022. We encourage the management to review the underwriting practices, claims management and manage its expenses to lower the combined ratio with a view of boosting future profitability prospects.

To improve the company's solvency position, we strongly recommend the company to:

- reduce its borrowing and rely more on equity financing which will strengthen the balance sheet without accruing additional liabilities.
- opt for short-term borrowings with low interest rates to reduce the financial burden on the company's resource.
- cede additional business to reinsurers which would help decrease the company's underwriting risk and liability, thereby improving its financial stability.
- Diversification of investments to reduce the property and concentration risks.
- Regularly review and adjust retention levels to balance between retaining profitable business and minimizing risk exposure.

We are delighted to have conducted this Financial Conditioning Report for International Energy Insurance Company. We hope you find this helpful for preparing and submitting a report to NAICOM.

We will be delighted to discuss it with you and make the necessary presentations.



Tinashe Mashoko,
FASSA, B Bus MSc (Actuarial Science)
Consulting Actuary



Chiedza Kondenga
BCom. Act Science
Senior Actuarial Consultant



Wayne Van Jaarsveld – FRC/2021/002/00000024507

B.Sc Actuarial Science, FASSA

In my capacity as an employee of Alexander Forbes Consulting Actuaries Nigeria Limited

On Behalf of Alexander Forbes Financial Services

27 July 2023

APPENDIX 1: RELIANCE & LIMITATIONS

Reliance

In carrying out this work we have relied upon the financial statements, business plans and other information (including discussions with the Management) provided by IEI. The liability information used was the same as that used in the IFRS actuarial valuations. As stated in this report we have reviewed this data for reasonableness, but we have not verified the accuracy of the information provided to us.

This report takes into account data made available as at 31 December 2022.

In some instances, we were unable to obtain granular information so had to make approximations in certain instances about the composition given knowledge of certain details during the normal end of the year valuation process.

Limitations

We understand that this report will form part of the Company's submission to NAICOM.

This report must be contained in its entirety, as individual sections, if considered in isolation, may be misleading.

Except with the consent of Alexander Forbes, the report and any written or oral information or advice provided by Alexander Forbes must not be reproduced, distributed or communicated in whole or in part to any other person or relied upon by any other person other than NAICOM.

The report may be distributed to the Senior Management of IEI for the purpose of discussing its contents.

Actuarial estimates are subject to uncertainty from various sources, including changes in claim reporting patterns, claim settlement patterns, judicial decisions, legislation, and economic conditions. It should therefore be expected that the actual emergence of profits will vary, perhaps materially, from any estimates.

APPENDIX 2: ECONOMIC CAPITAL RESULTS AT 95% CONFIDENCE LEVEL

Should we lower our confidence level to 95%, the total economic capital requirement reduces to N5.1 billion which represents -73% of the shareholder funds as at December 31, 2022.

Risk Type	Risk Type	2022 (N'000)
Non-Life Underwriting Risk	Reserve Risk	991 314
	Premium Risk	91 958
	Catastrophe Risk	35 754
	Lapse Risk	-
	SCRnl Pre-Div	1 119 027
	SCRnl Div Credit	172 425
	SCRnl Post Div	946 602
Market Risk	Interest Rate Risk	435 375
	Equity Risk	-
	Property Risk	4 173 166
	Spread Risk	-
	Currency Risk	-
	Concentration Risk	1 432 632
	SCRmkt Pre-Div	6 041 173
	SCRmkt Div Credit	1 491 798
	SCRmkt Post Div	4 549 375
Counterparty Default Risk	Reinsurance credit	44 040
	Investment credit & Debtors	1 085 305
	SCRdef Pre-Div	1 129 344
	SCRdef Div Credit	-
	SCRdef Post Div	1 129 344
Diversified BSCR		6 625 321
Diversification Credit		686 616
Basic SCR		5 938 705
Operational Risk		169 629
Final Economic capital		6 108 334
Shareholders' Funds		- 12 148 398

Shareholder funds as % of Economic Capital	-50%
--	------

APPENDIX 3: ECONOMIC CAPITAL METHODOLOGY & STRESS LEVEL DERIVATION

We present below, detailed explanation of how each of the risks was modelled including stress levels derivation.

MARKET RISKS

- Market risk is defined as the potential for adverse change in the net assets (Market Value of assets less Market Value of liabilities) due to movements in market factors such as equity prices, interest rates, property prices and foreign exchange.
- The company's insurance funds are mainly invested in money market instruments and hence have very low exposure to market risks.
- Credit spread and liquidity risks have not been explicitly calculated for the following reasons:
 - Credit spread – the company has no corporate bond holdings as part of assets backing technical provisions and hence no credit risk exposure.
 - Liquidity risk – this is a difficult risk to quantify within the economic calculations. The Company is recommended to ensure that a robust Liquidity management policy is in place to be able to monitor this risk.
- The market risk capital requirement **CMkt** for each risk was calculated using the following formula:
- The overall market risk capital requirement is calculated by the formula:

$$SCRMkt = \sqrt{\sum_i \sum_j^n CorrMkt_{i,j} * Mkt_i * Mkt_j}$$

Where

Mkt_i = the market risk sub – module i (can be any of the three risks)

Mkt_j = the market risk sub – module j

$CorrMkt_{i,j}$ = the correlation parameter between components i and j as shown below in Appendix 4

Interest Rate risk

- Interest rate risk is caused by the sensitivity of the value of any assets, liabilities and financial investments to fluctuations in the term structure of interest rates or interest rate volatility, whether valued by mark-to-model or mark-to-market techniques.
- The stresses used are shown in table 3 above at various confidence levels to all bond yields of varying duration according to the Company bond holdings.
- The stressed yields were applied using the formula: current yield x (1+Upward stress) OR current yield x (1+Downward stress).
- The capital requirement was then determined by adopting the stress level (between the upward and the downward stress) that resulted in a higher capital requirement i.e., Interest Rate capital requirement = Max {0; Upward stress capital; Downward stress capital}
- The overall market risk capital was then derived by combining the equity, property and interest rate risk capital using the suggested correlation matrix below.

Property Risk

- Property risk arises when the market values of assets and liabilities are sensitive to changes in the level of market prices of property. The most significant part of this risk is the risk of economic loss due to the effect of the volatility and uncertainty of future interest rates on the mismatch of cash flows from interest sensitive assets with liability cash flows.
- The capital requirement for property risk ($Mktprop$) is calculated as:

$$Mktprop = \max(\Delta BOF | \text{property shock}, 0)$$

Where: i. ΔBOF = the change in the value of Basic Own Funds

Property shock = an instantaneous decrease of 25% in property values.

- The stress should be replaced by an equal but opposite shock if the application of the property shock stress scenario results in a capital need for property risk that is less than zero (i.e., if $Mktprop < 0$). Any short positions in property must be taken into account in this situation, even if they don't meet the criteria for an appropriate risk mitigation strategy.
- Where a causal relationship exists between property price changes and policyholder behaviour, the calculation of the property risk capital requirement may take into account changes to policyholder behaviour.

Concentration risk

- Concentration risk Concentration risk refers to the risk of potential losses on investments over and above the systematic risks arising from the portfolio of investments when the portfolio of investments is not sufficiently diversified. The capital requirement for concentration risk ($Mktconc$) is calculated as:

$$Mkt_{conc} = \sqrt{\sum_i Conc_i^2}$$

Where:

- i. $Conc_i = \Delta BOF$ | concentration shock i
- ii. Concentration shock i = an instantaneous decrease in the value of E_i ; where the decrease in value is calculated as:

$$XS_i * g_i * Assets_{xl}$$

$g_i =$	A factor dependent on the credit quality of the counterparty i ,
$XS_i =$	The excess exposures per counterparty i as follows: $XS_i = \max\left(\frac{E_i}{Assets_{xl}} - CT_i, 0\right);$
$E_i =$	Total exposure-at-default to counterparty i
$Assets_{xl} =$	Total assets considered in the scope of the concentration risk module (including government bonds) with no allowance for loss-given-default; and
$CT_i =$	The concentration threshold to counterparty i , which depends on the credit quality step of the counterparty i ,

Non-Life Insurance risks

- The non-life insurance risks modelled were:
 - Reserving risk
 - Premium risk
 - Catastrophe risk

Premium Risk

- Non-life premium risks refer to the risk of loss, or adverse change in the value of insurance liabilities, resulting from fluctuations in the timing, frequency and severity of insured events and in the time of claim settlements.
- Premium risk results from fluctuations in the timing, frequency and severity of insured events. For primary insurance business, premium risk relates to policies to be written (including renewals) during the period, and to unexpired risks on existing contracts.
- Premium risk includes the risk that premium provisions turn out to be insufficient to compensate claims or need to be increased.

- The capital requirement for premium risk shall be computed as the sum of the product of risk factors and the premiums reserves for sub classes of insurance business.
- The premium reserve is the sum of the unearned premium and additional unexpired risk.
- The risk factors considered for premium risk are as given below;

Reserving risk

- This is one of the sources of underwriting risk for general insurance.
- Reserve risk results from fluctuations in the timing and amount of claim settlements.
- The capital requirement for reserve risk shall be computed as the sum of the product of risk factors and the claims reserves for sub classes of insurance business.
- The claim reserve is the sum of incurred but not reported (IBNR), Outstanding Claims (OCR) and incurred but not enough reported (IBNER).
- The risk factors considered for reserve risk are as given in section 6 of this technical specification

Catastrophe risk

- This is Catastrophe for the general insurance business.
- It covers mainly high severity and low-frequency catastrophic events e.g., floods, hurricanes, large accidents impacting on all general insurance lines of business insured by the Company.
- The capital required for catastrophic risk shall be computed as the sum of the product of risk factors and the net earned premiums for each class of business
- The correlation matrix used is shown below.

CorrNL	Premium Risk	Reserve Risk	Catastrophic Risk
Premium Risk	100%	25%	0%
Reserve Risk	25%	100%	0%
Catastrophic Risk	0%	0%	100%

Risk Factors for Non-life Underwriting risk

The risk factors considered for the Premium, Claims and Catastrophic risk are as shown in the table below:

Main Class	Sub-Class 1	Premium Risk Factors	Claims Risk Factors	Catastrophic Risk Factors
Property Damage (with liability)	Liability	25%	27%	5%
	Engineering all risks	32%	26%	5%
	Fire	30%	26%	5%
	Farming	30%	26%	5%
	Motor	22%	19%	5%
	Aviation	34%	30%	5%
	Marine	29%	23%	5%
Financial Loss	Bonds	30%	32%	5%
	Hire Purchase	30%	32%	5%
Fixed benefits	Accident	23%	20%	5%
	Travel Insurance	34%	30%	5%
	Legal	25%	27%	5%
	Liability	36%	22%	5%
	Fidelity Guarantee	30%	32%	5%

B. CREDIT RISK

Credit risk arises as a result of the unexpected default, or deterioration in credit standing, of an insurer's counterparties or debtors.

The scope of the calculation under this risk module covered possible defaults by banks; where cash and cash equivalents are held by the Company, defaults by reinsurers compromising reinsurance recoveries and the inability by debtors to pay their dues.

The following exposures to counterparties were used:

- Banks → cash and cash equivalent holdings
- Reinsurers → estimated reinsurance recoveries over the next 12 months
- Debtor → amounts owed.

The expected losses given default were calculated using the latest credit ratings and associated probabilities of default for the different counterparties. A combination of local agencies and the S&P default rates were used for the bank holdings as per the following table.

Rating Scale	Default Probability
AAA	0.01%
AA+	0.01%
AA	0.02%
AA-	0.03%
A+	0.06%
A	0.09%
A-	0.11%
BBB+	0.16%
BBB	0.22%
BBB-	0.39%
BB+	0.54%
BB	0.81%
BB-	1.39%
B+	2.54%
B	5.37%
B-	8.72%
Unrated	26.53%

The above default rates were applied to both the banks and reinsurers' counterparties to the Company.

The formula used was: Estimated exposure x Probability of Default.

OPERATIONAL RISK

This is the risk of loss arising from inadequate or failed internal processes, or personnel and systems, or external events.

Operational risk is generally a material risk and one of the major causes of organizational failure.

There are several approaches used to assess Operational risk namely;

- Basic indicators or some Standard Formula – this is a simpler approach and largely defined by regulatory bodies. It is transparent and a well-known approach.
- Scenario approach – qualitative scenario assessments of the operational risks as defined by management through the risk heat map are transformed into quantitative assessments to determine the overall operational risk capital
- Statistical or Loss Distribution Approach – this uses a lot of statistics. The amount of possible losses and frequency of losses are modelled separately and then combined to determine the overall capital requirement. This approach relies on the availability of credible historical and forward-looking data.
- The Structural or Causal approach – this is the most complex and recently researched approach. It also relies on understanding the interdependencies across risks in addition to the data availability.
- We adopted the standard formula approach due to the limited quantity of data available. The approach took into account the earned premium, technical provisions and Base capital calculated before operational risk.

The formula used to compute the capital requirement was as follows:

$$Cop = \text{Min} \{0.3 * BSCR, BOp\} + 0.25 \times Expnl$$

Expnl is the amount of annual expenses incurred during the previous 12 months in respect of non-linked business

BSCR is the preliminary capital required before allowing operational risk and, for the risk requirements it is defined as:

$$CR Op = \Sigma (Cins + CMkt + Ccredit)$$

BOp is the basic operational risk requirement for all business and is determined as follows:

$$BOp = \text{Max} \{Oppremiums; Opprovi \}$$

Where

$$Oppremiums = 0.03 \times Earnnl + \text{Max} \{0, 0.03 \times [Earnnl - 1.1 \times pEarnnl]\}$$

$$\text{and } Opprovisions = 0.03 \times \text{Max} \{0, TPnl\}$$

Earnnl are the gross premiums earned during the previous 12 months.

pEarnnl are the gross premiums earned during the 12 months prior to the previous 12 months.

TPnl are the technical provisions

APPENDIX 4: CORRELATION MATRICES

Correlations for Market risks have been derived using actuarial judgement and referencing correlations being used in other jurisdictions for new solvency regimes.

Local market relevance was taken into account before applying these correlations. As a rule of thumb, the following thought process was applied:

Correlation coefficient	Interpretation
0%	Independent
25%	Weakly correlated
50%	Moderately correlated
75%	Strongly correlated
100%	Dependent

The correlation matrices used for diversification are shown below. Market risk correlations.

Parameters						
Corrij	Mktint	Mkteq	Mktprop	Mktsp	Mktconc	Mktfx
Mktint	100%	0%	0%	0%	0%	25%
Mkteq	0%	100%	25%	75%	0%	25%
Mktprop	0%	25%	100%	50%	0%	25%
Mktsp	0%	75%	50%	100%	0%	25%
Mktconc	0%	0%	0%	0%	100%	0%
Mktfx	25%	25%	25%	25%	0%	100%