# Swiss Re's approach to Enterprise Risk Management

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# Enterprise Risk Management

Principles established and processes executed to systematically and comprehensively address risks (threats and opportunities) across all functions in order to:

| Protect the Group's franchise value | & | Enable sustained economic profit |
|---|---|---|

# Enterprise Risk Management
## Protect & Enable

### Protect the Group's franchise value

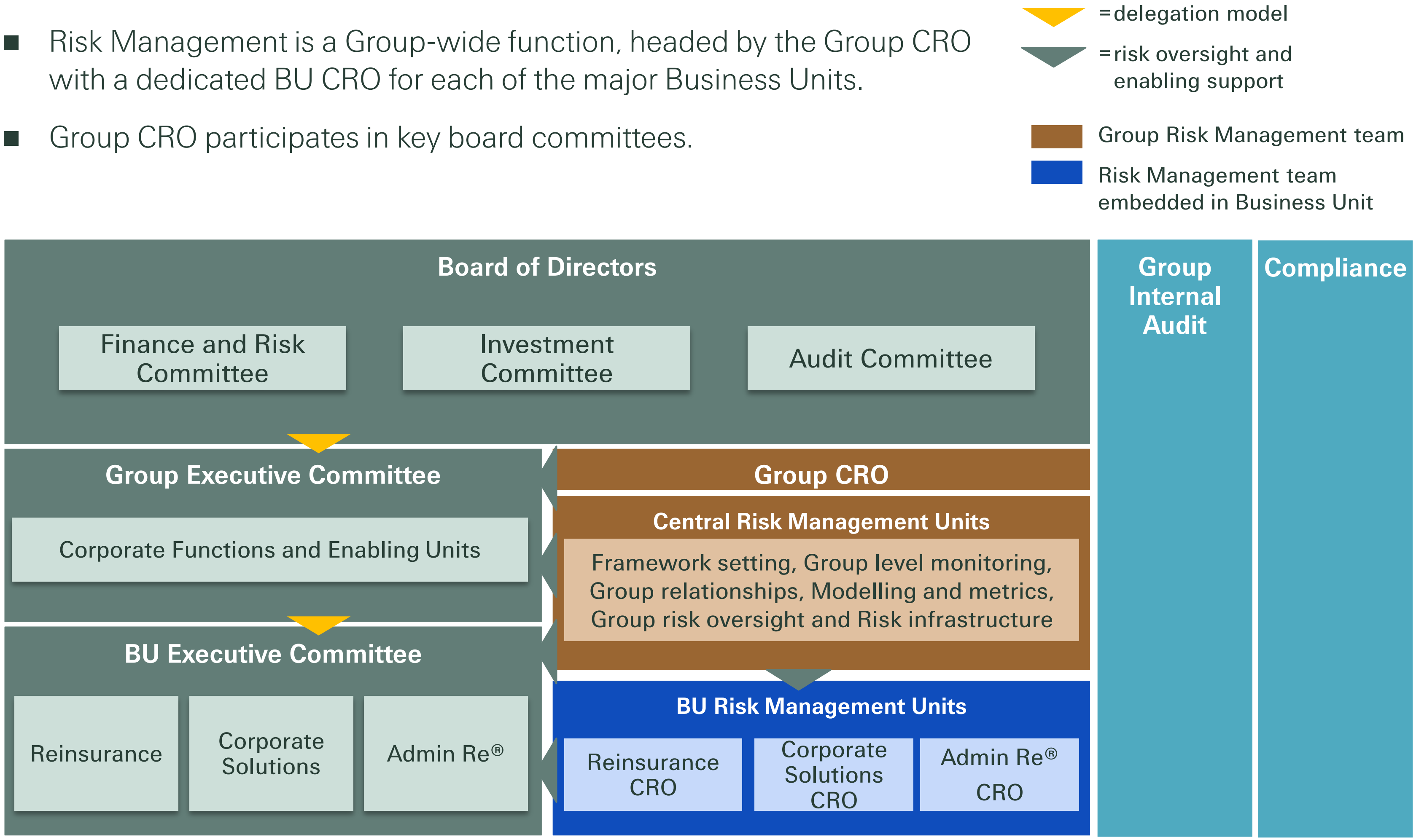
- ... with an independent team of respected risk and actuarial professionals, accountable for providing transparency of current and future risks and ensuring the capital adequacy of the Group and its entities as well as for reserves and valuation
- ... by providing rigorous risk analytics, model review and pre-emptive recommendations to enable controlled risk taking and foster a risk-aware culture throughout the organisation and to influence regulatory developments

### Enable sustained economic profit

- Identify and understand the drivers of change for our business performance
- Understand the 'sensitivity' of the economic profit to drivers of change earlier than others
- Measure the profit 'volatility' w.r.t to the modelled risk factors
- Develop 'plausible scenarios' for potential huge cumulative losses
- Monitor and control

# Key risk management bodies and functions

- Risk Management is a Group-wide function, headed by the Group CRO with a dedicated BU CRO for each of the major Business Units.
- Group CRO participates in key board committees.



# Risk Management
## Functional organisation

**Business Unit Risk Management**

| Group Risk Management | **Risk Management Admin Re** Philip Long | **Risk Management Reinsurance** Peter Grewal | **Risk Management CorSo** Niranjan Nathan |
|---|---|---|---|
| | | Insurance Risk Management | P&C Risk Management |
| | BU Reserving | | BU Reserving |
| **Group Qualitative Risk Management** Nina Arquint | Regulatory & Governmental Affairs - Americas / Asia / EMEA | | |
| | BU Operational RM | BU Operational RM | BU Operational RM |
| **Group Risks & Analytics** Peter Sohre | BU Risk Governance & Reporting | BU Risk Governance & Reporting | BU Risk Governance & Reporting |
| **Financial Risk Management** Attila Kerenyi | BU FRM | BU CRM | BU CRM |
| **Actuarial Control** Mike Eves | P&C and L&H | | |

Group risk management team

Risk management team embedded in a Business Unit

# Three pillars of risk management:
## Framework for controlled risk-taking

### Risk quantification

- Sound valuation and risk measurement
- Quantitative risk limit monitoring system
- Reliable capital adequacy framework

### Risk governance

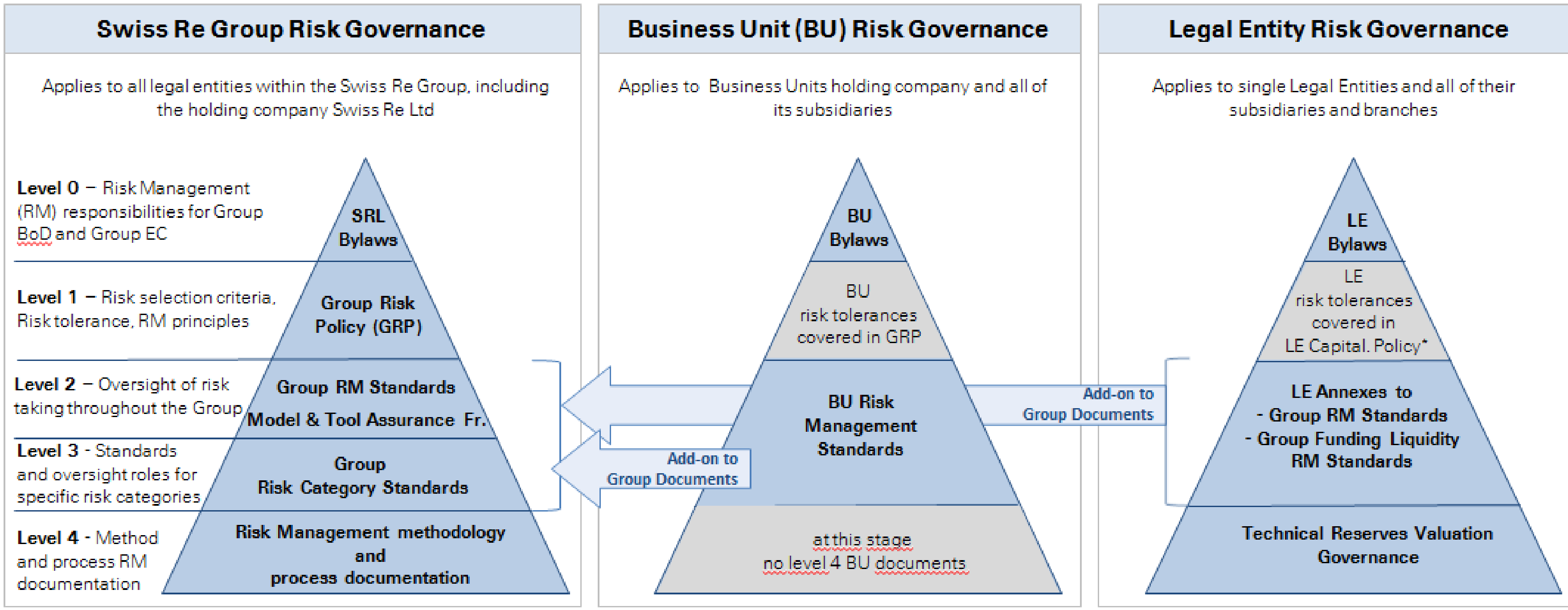
- Defined responsibilities for risk taking and risk management
- Sound, documented:
  - risk management policies
  - operating, reporting, limit monitoring, and control processes
- Regulatory compliance
- Independent audits of processes and figures

### Risk transparency

- Financial + risk disclosure, incl. information on tail risk and scenarios
- Company-wide risk culture

# Risk governance

# Group, Business Unit and Legal Entity Risk Governance
## Documentation build-out to lower levels follow an 'addendum' strategy



# Group Risk Policy governs risk taking at Group, Business Unit, Legal Entity and Branch level

## Swiss Re's risk culture

### Risk appetite framework

**Risk appetite**

→ describes the level and types of risks a company wishes to take in pursuit of its business strategic goals

**Risk tolerance**

→ represents the aggregate amount of risk a company is willing to accept within the constraints imposed by its capital and liquidity resources, strategy, risk appetite and regulatory and rating agency environment

### Risk management principles

**Controlled risk taking**

→ clearly specified risk policy and risk control framework

**Clear accountability**

→ individuals held accountable for decisions

**Independent risk controlling function**

→ avoid conflicts of interest

**Open risk culture**

→ risk transparency at all levels

# Swiss Re's risk landscape

| Categorisation of Swiss Re's risk landscape | | |
|---|---|---|
| **Core risks** | **Operational risks** | **Other risks** |
| **Insurance**<br>• Property and casualty<br>• Life and health | **People** | **Liquidity** |
| | **Processes** | **Strategic** |
| **Financial market**<br>• Credit spread<br>• Equity market<br>• Foreign exchange<br>• Interest rate<br>• Real estate | **Systems** | **Regulatory** |
| | **External** | **Reputational** |
| **Credit**<br>• Credit default<br>• Credit migration | | |

**Emerging risks**

# Risk controlling across Swiss Re
## Insurance risk controls

**Available Capital**

Allocated risk limits restricted by risk tolerance criteria

Risk limits on relevant risk drivers and possible high risk accumulation

**Portfolio**

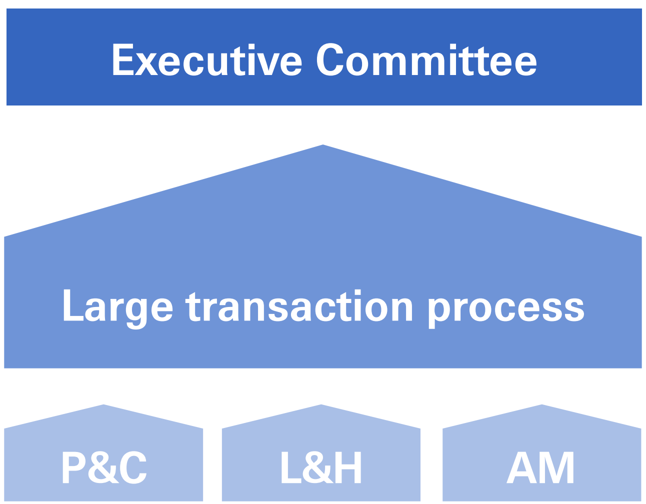
Exposure monitoring & accumulation control, model validation, business risk review, costing & reserving linkage, Terms of Trade, costing parameters task-force

**Deal**

Underwriting authority framework, underwriting guidelines

# Risk controlling across Swiss Re
## Approval process of large transactions

Mandatory group-wide approval process of large transactions ensures proper balance of risk and reward:




- Approval body for large and strategic transactions
- One common formalised process
(clear triggers and process steps)
- Three independent signatures
(Client Markets, Products, Risk Mgmt)

Risk management impacts business decisions through review and recommendation of large transactions

# Risk controlling across Swiss Re
## Three lines of defence

Business Units perform day to day risk management, with Risk, Compliance and Internal Audit providing independent assurance on adherence to guidelines, risk tolerances, limits and control performance.

**Board of Directors (BoD)**

Finance and Risk Committee

Investment Committee

Audit Committee

*Defines Group risk appetite and tolerance*

**Group Executive Committee (GEC)**

*Sets Group and BU business plan*

1st line of control

**Business operations (Risk taking)**

*Develop, implement and maintain an effective risk control environment, including*

- *Identify and measure risk exposure*
- *Develop risk mitigation strategies*

2nd line of control

**Risk Management (Risk controlling)**

- *Develop, implement & maintain Swiss Re's risk management framework*
- *Provide independent assurance of controls over risk taking activities*

3rd line of control

**Group Internal Audit (Independent assurance)**

- *Audits activities of 1st and 2nd lines of defence*

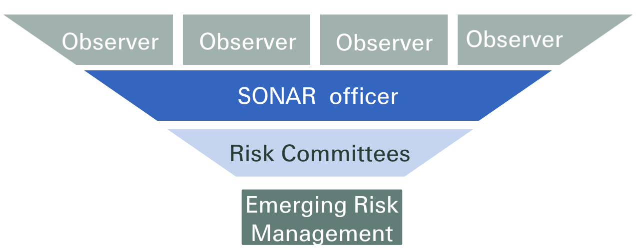
Group RM team

RM team embedded in a Business Unit

# Emerging Risk Management

## Comprehensive approach to identify emerging risks, create risk awareness, support business decisions and provide risk transparency

- Since 2000, Swiss Re has built up a Group-wide process (“SONAR”) to proactively identify, assess and mitigate emerging risks.
- SONAR generates a steady flow of notions from which ca. 90% are parked and ca. 10% are further assessed (e.g. risk sparks). Scenario thinking is used to explore and assess potential worst case events.
- Emerging Risk Management has an on-going mandate to undertake horizon scanning and to provide input on newly identified emerging risks to RM risk committees and risk reporting.




- Examples of risks identified in the SONAR process include:
  - Climate Change Litigation
  - Nanotechnology
  - Electromagnetic Fields
  - Power Blackouts
  - Critical Infrastructure...
  - Cyber Vulnerability
  - Pandemics
  - Longevity
  - Obesity
  - Sovereign Debt Crisis

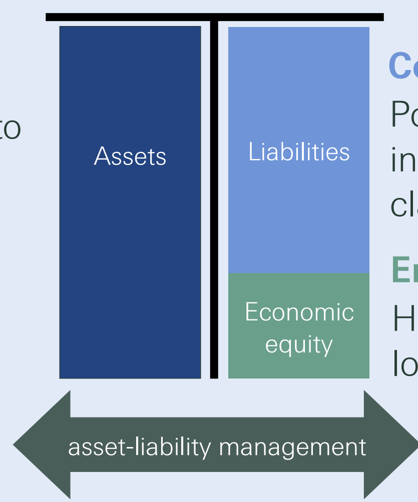
| SONAR notions and trend input: risk identification and assessment | | |
|---|---|---|
| **Risk communication** | **Balance sheet protection** | **Product development** |
| **Raising awareness** | **Limiting downside risk** | **Product & service development** |
| **Enhance risk dialogue**<br>Foster risk under-standing and start emerging risk dialogue with clients and stakeholders | **Prevent losses**<br>Early warning: mitigate, adapt to or transfer emerging risks | **Enabling new business**<br>Deliver ideas for innovative products and services; trigger product development |

# Risk quantification

# Key tasks of a risk management function
## Capital and liquidity risk management

**Four key control requirements of insurers ...**

### Insurer balance sheet




**Ensure asset liquidity**
Hold enough liquid assets to meet expected and un-expected liquidity requirements

**Control diversification**
Pool large number of sufficiently independent risks, to make aggregate claims more predictable

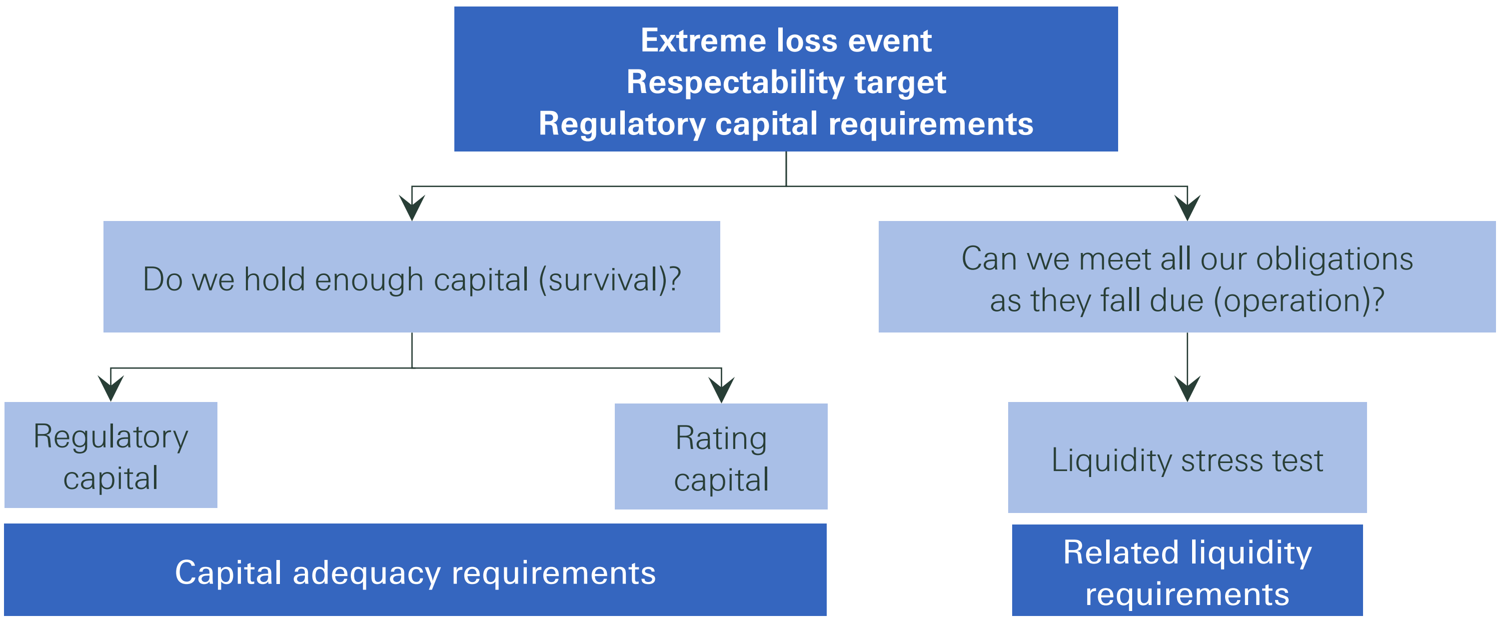
**Ensure capital adequacy**
Hold risk capital to absorb unexpected losses

**Control ALM risk**
Invest premiums and capital to match market risk of liabilities

# Risk tolerance

The risk tolerance represents the amount of risk Swiss Re is willing to accept within the constraints imposed by its capital and liquidity resources, its strategy, its risk appetite, and the regulatory and rating agency environment. It is based on the following objectives:

- Maintain capital and liquidity that are sufficiently attractive from a client perspective, and that meet regulatory requirements and expectations ("**respectability criteria**")
- Be able to continue to operate following an extreme loss event ("**extreme loss criteria**"):



# Swiss Re's risk tolerance
## Group-level respectability and extreme loss criteria

Group

Capital criteria | Liquidity criteria

### Respectability criteria

Maintain capital and liquidity that are sufficiently attractive from a client perspective, and that meet regulatory require-ments and expectations

Solvency I > 150%

Rating > AA

SST > 185%

- Level reflects regulator and client requirements

Assuring both sets of constraints determines the additional funding required to be held at Swiss Re Ltd. level as well as the basis for external dividend proposals.

### Extreme loss criteria

Be able to continue to operate following an extreme loss event

After an extreme loss event (99% shortfall) able to meet

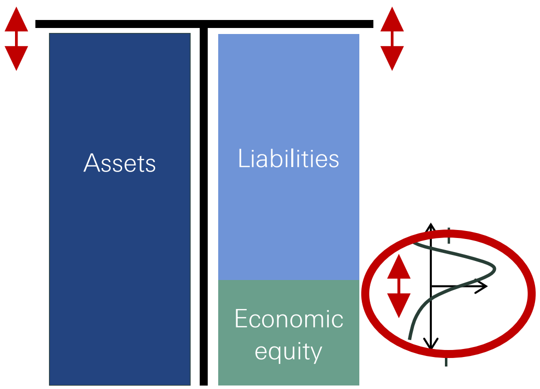
SST > 100%

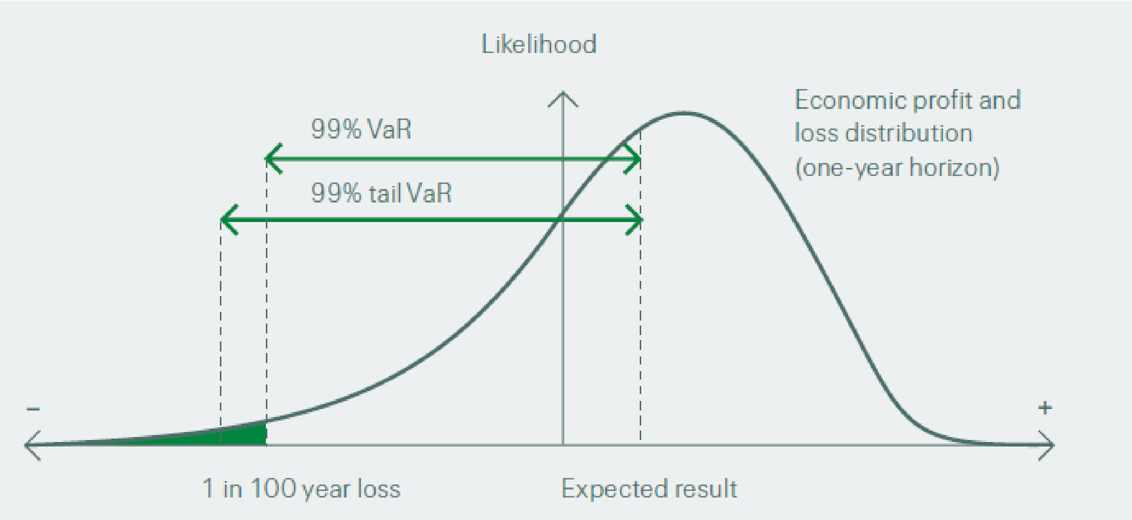
Liquidity

- Minimum statutory capital to be in a position to continue to write new business, for all major entities.
- Sufficient liquidity to fund subsidiary recapitalizations where needed and cover committed requirements in the year following the stress loss.

# Risk measures used to quantify economic risk and analyse capital requirement

### Insurer balance sheet




### Value at Risk (VaR)

99% VaR represents the difference between the expected result and the adverse result with a frequency of once in one hundred years.

### Shortfall (Tail VaR)

99% shortfall represents the difference between the expected result and the *average* adverse result with a frequency of less than once in one hundred years.

# Core risks are quantified in Swiss Re's integrated risk model

## Tested expertise

- Swiss Re's integrated risk model has been developed over more than 15 years
- Internal model used for articulating risk tolerance, for assessing performance and for setting targets
- Regular public disclosure of risk information based on internal model since 2004
- Regular use for granular Swiss Solvency Test since 2008

## Strong governance

- Strong governance around model changes: any major model change needs to be approved at EC level
- External model review performed by Deloitte in 2011. The review did not identify any critical issue; Supervisory model reviews with FINMA, CAA and FSA ongoing

# Limit framework

## Derived during annual planning process

- Actual situation from all capital perspectives
- Risk tolerance criteria of the Board
- Risk appetite derived by optimisation procedures
- Shortfall of Annual Plan determined
- Limits set based on Plan plus buffer
- Plan broken down to risk capacity limits
- Plan and scenario of Full Limit Usage tested against risk tolerance

Available capital

Risk tolerance

Annual Plan

Shortfall of Plan
(TailVaR 99%)

### P&C risk

- Nat Cat
  - TC North Atlantic
  - WS Europe
  - EQ California
  - EQ Japan

Business capacity measure

### L&H risk

- Mortality trend
- Lethal pandemic
- Longevity

Business capacity measure

### Financial risk

- Equity
- Hedge Funds
- Interest Rate
- Real Estate
- Credit (spread & default)

Business capacity measure

Financial Market Stress Test Limit framework

# Limit Framework

## Three different 'levels' of limits in place

**Risk tolerance limits**

**Maintain liquidity and capital adequacy**

*<u>Respectability and Extreme Loss Limits</u> at Group, Business Units and legal entity level, as set out in the Group Risk Tolerance Criteria of the Group Risk Policy*

**Risk capacity limits**

**Ensure adherence to Risk Tolerance**

*<u>Risk category limits</u>; P&C, L&H, Financial Market and Credit.*

*<u>Risk factor limits</u>: e.g Nat Cat, Lethal Pandemic, Credit, Equity etc.*

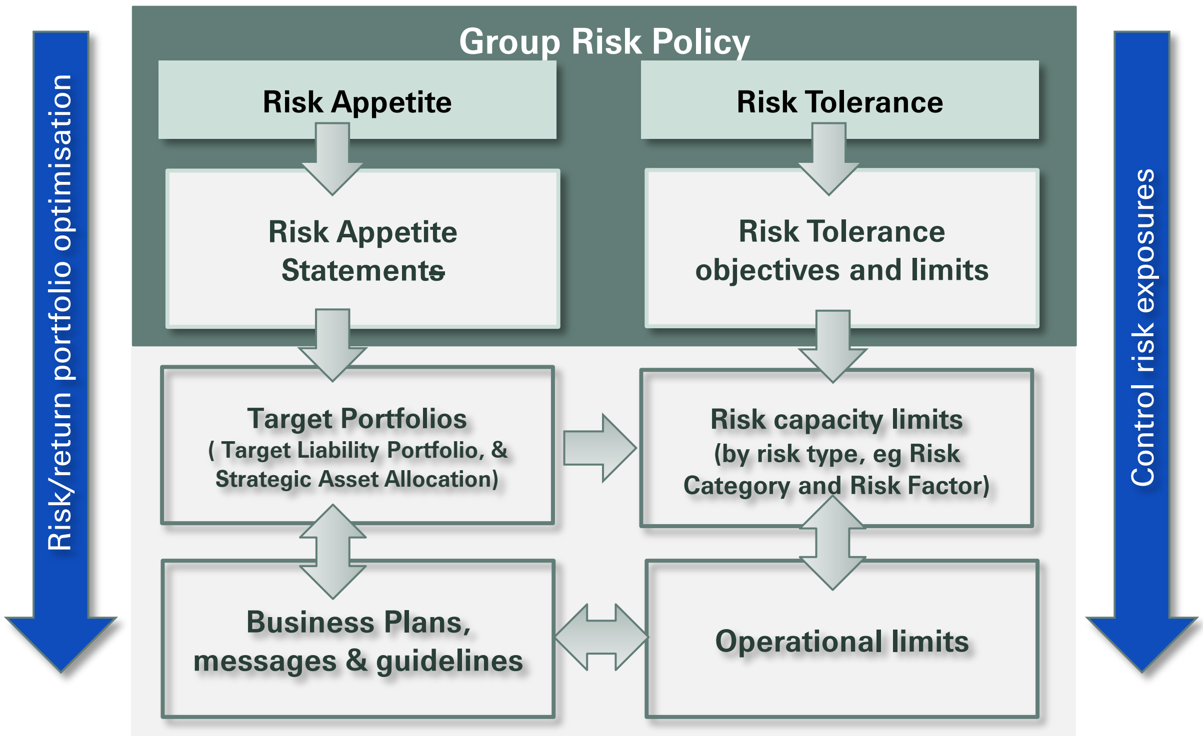
**Operational limits**

**Delegate to business via operational limits / referrals**

*UW authority limits, counterparty limits, etc.*

# Link between Group Risk Appetite and Risk Tolerance
## Controlled risk-return optimisation

- Risk appetite is an expression of the types of risk that Swiss Re wants to take or avoid.
- Risk tolerance criteria detail the extent to which the SRL Board of Directors has authorised Group and Business Unit Executive Management to assume risk.



# Risk appetite statement structure
## Overarching principles

### Principles on acceptable risks

- We seek insurance risk and as a consequence also take financial market risk.
- We seek risk that is profitable from a risk/return view, that we understand and manage and where potential risk accumulations are understood and can be controlled.
- Within tolerance limits, the Group also accepts operational risks inherent in its activities.
- Business activities must comply with
  - laws & regulations,
  - Swiss Re's Code of Conduct, and
  - Sustainability Framework.

### Principles with respect to key risks to achieving our Strategy

**Achieve target performance**

- Pursue business when risk-adjusted returns as well as terms and conditions are attractive
- Write well-diversified business across all major markets

**Provide liquidity and financial flexibility**

- Ensure appropriate mix of short and long term business and investments
- Prefer high quality assets

**Manage capital adequacy**

- Avoid being over-exposed to a single source of risk
- Ensure efficient funding structure by choosing an appropriate mix between equity- and debt-funding

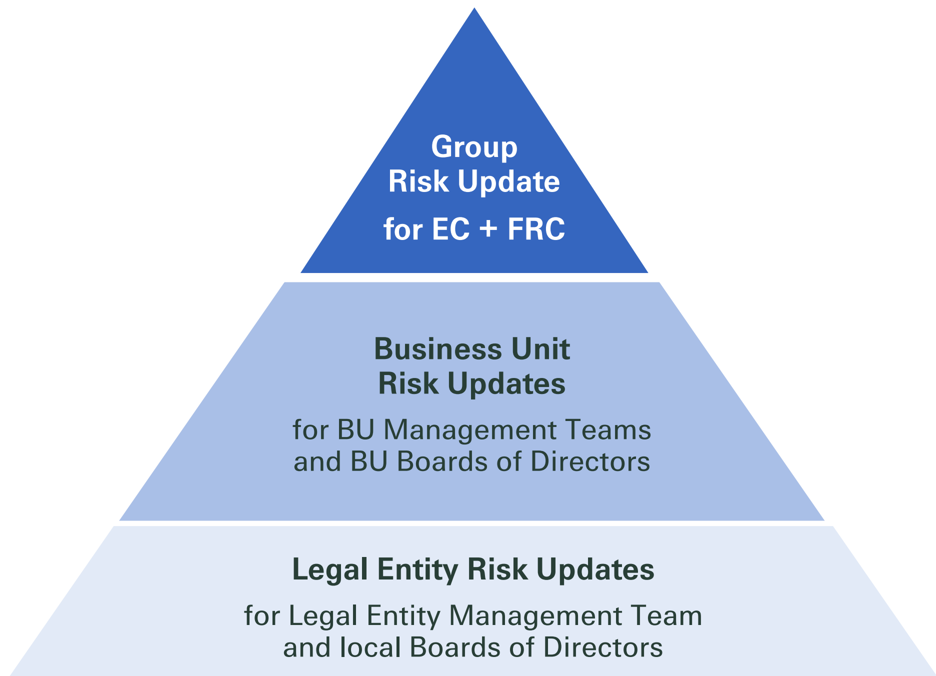
**Protect and grow franchise value**

- Avoid actions that could result in a loss of stakeholder confidence
- Be transparent on activities and associated risks to reduce reputational risk from surprise-losses

# Risk transparency

# Risk Transparency
## Comprehensive internal and external risk communication

**Internal risk communication**
Internal risk transparency ensures risk transparency at all levels of the organisation; robust risk reporting enhances decision making




**External risk communication**
Long history of reporting externally generates trust and ensures compliance with regulatory requirements and transparent risk information for rating agencies, clients and the public

# Swiss Re's governance practice
## In line with Solvency II ORSA requirements

**Own** **Risk** and **Solvency** **Assessment**

- **Own:** Based on the **own risk measure** (reconciled to regulatory risk measure)
- **Risk:** The scope **are all identifiable risks** - also the risks the company may face in the **longer term**
- **Solvency:** **Solvency on continuous basis** from an internal and regulatory perspective to be ensured
- **Assessment:** **Identification, assessment, monitoring and management** based on
  - strategic plan
  - strategic decision planned
  - factual to ensure solvency on continuous basis

# Swiss Re's Own Risk and Solvency Assessment

- Group ORSA builds on activities and tasks already undertaken by the GEC and BoD
- Group Executive Committee and Board of Directors see all components of ORSA, but this is spread throughout the year as parts of already existing processes and policies.
- ORSA impacts all major entities and a large number of smaller entities throughout the Group: The three common building blocks of ORSA are broadly similar throughout the world: The actual ORSAs differ mainly in terms of emphasis on particular components, as well as the level of prescription and regulator expectations

Regular risk reporting

SST

Group policy reviews

1-year budgeting

3-year plan

Target setting

| ORSA | |
|---|---|
| **Building Blocks** | **Content** |
| **Governance and risk management practices** | Description of key processes, policies and characteristics within Swiss Re Group |
| **Current Risk Profile** | Overview of current solvency and capital positions, risk profile and risk assessments, and commentary on the development of risks. |
| **Forward-looking assessment** | Overview of the 3-year business strategy and its implication on the risk profile. Summary of the scenario analysis and resulting mitigating actions. |

Capital & funding plan

Recovery planning

Scenario analysis

# Embeddedness of ERM in Swiss Re´s Business Process

# Three pillars of risk management:
## Framework for controlled risk-taking

### Risk quantification

- Sound valuation and risk measurement
- Quantitative risk limit monitoring system
- Reliable capital adequacy framework

### Risk governance

- Defined responsibilities for risk taking and risk management
- Sound, documented:
  - risk management policies
  - operating, reporting, limit monitoring, and control processes
- Regulatory compliance
- Independent audits of processes and figures

### Risk transparency

- Financial + risk disclosure, incl. information on tail risk and scenarios
- Company-wide risk culture

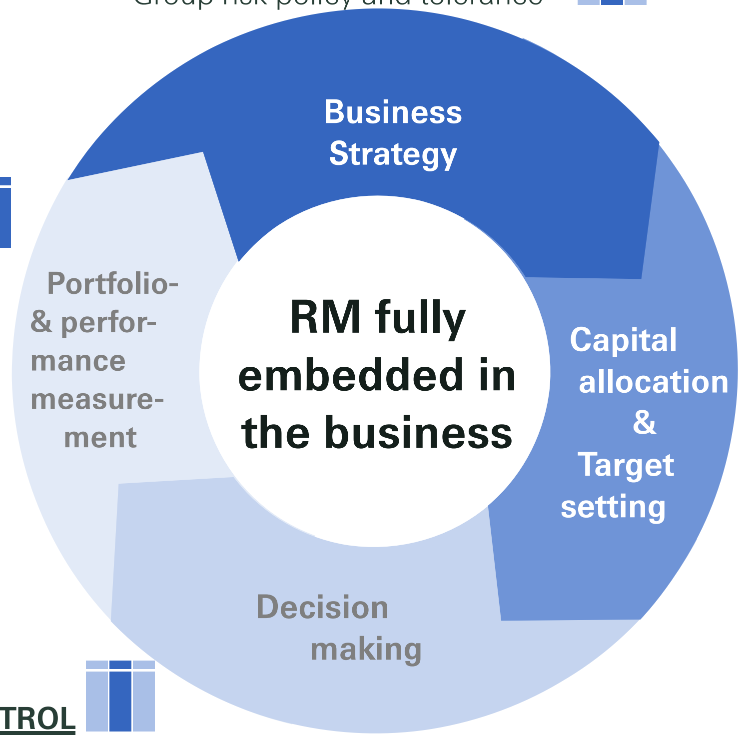
# Risk Management is core to successfully running the business

**RISK & SOLVENCY ASSESSMENT**

- Group risk policy and tolerance

**RISK MONITORING & REPORTING**

- Limit monitoring
- Accumulation control
- Regular Reporting of risk changes and impact on capital adequacy




**RISK APPETITE**

- Plan optimisation and capital allocation using Risk Model outputs
- Testing of business plan against Risk Tolerance
- Limit framework – Risk Capacity limits are set for all material risks
- Compensation based on risk-adjusted returns

**RISK CONTROL**

- Part of all decision taking bodies concerned with risk taking
- Large transaction approval
- Risk Management Standards
- Robust operational controls in place and regularly tested

# Summary & conclusion

# Summary

## Swiss Re fosters a pro-active risk management culture that enables controlled risk-taking and sustainable risk-adjusted returns

- Swiss Re's Risk Management function is **aligned to the organisational structure** to support and control both Swiss Re Group and the Business Units. Independence maintained by Business Unit dedicated Risk units reporting to Group CRO with **strong mandate to challenge.**

- Swiss Re has been using an **integrated approach** to Risk Management for more than a decade – risk taking is effectively controlled by
  - clearly defined risk tolerance and derived consistent limit framework
  - a strong risk governance framework

- Risk Management is **core to Swiss Re's business model**. Risk Management is **present in all key decision bodies and fully embedded in steering processes**; it influences all strategic business decisions and its signature is required for all material risk taking decisions

- Well-established **expertise in risk modelling** provides a sound basis for risk assessment under economic based solvency regimes

- **Comprehensive risk reporting** ensures transparent risk information, quick escalation of issues as well as timely decision making and action planning

# Conclusion
## Five Golden Rules for a successful ERM

| | |
|---|---|
| **Know who is responsible for what** | Establish appropriate **governance and oversight** |
| **Make your word count among decision-makers** | Ensure the **Risk view is represented in key strategic decisions** |
| **Use the best instruments, but know their limitations** | Combine **models and frameworks with solid judgement** |
| **Use your imagination – think the unthinkable** | Consider **what could really go wrong and steer around it** |
| **Have the courage to speak up** | Risk must speak up to **provide transparency and challenge** |