

# HIS RM Service

# HIS Institute of Risk Management



**HIS** Institute of Risk Management comprised with highly educated specialists, **HIS** utilizes its wide professional network and the variety of RM tools to provide the best risk management services to the clients.

HIS Institute of Risk Management(HIRM) provides optimized risk management solutions derived from the latest risk analysis methodology to customers based on the accumulated knowledge of HIS. The core value of HIRM is to provide comprehensive risk management services that can protect customers' assets from various risks ranging from risk inspections for insurance coverage to property risks, natural disasters and environmental pollution. HIRM is willing to provide greater value to clients by combing RM services with rapidly evolving InSureTech technology.

## HIS Institute of Risk Management

Sam Choi   Director	James Lee   G.M.	Reo Choi   Manager	Steven Kim   A.M.	Harlie Lee   Associate
Head of HIRM   Ph.D.	Master of Eng.	Master of Eng.	Bachelor of Eng.	Bachelor of Eng.
RM Career: 22 yrs.	RM Career: 17 yrs.	RM Career: 8yrs.	RM Career: 3yrs.	RM Career: 2yrs.

## Our Network

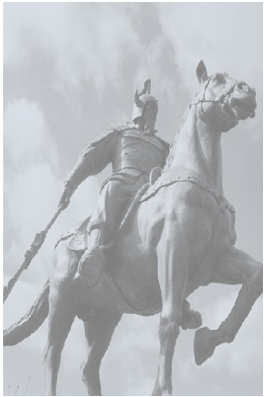
- Global Broker Network: GGA, WBN, TRC
- RM Global Network: Allesco, Price Forbes, AIR Worldwide etc.
- RM Local Network: Korean Society of Hazard Mitigation etc.

## Risk Management Tool

- Fire/Explosion Simulation: Ex-Tool, ALOHA
- Net-Cat Analysis: Touch Stone (AIR)
- Natural Hazard: HIS Global Natural Hazard Map
- Property Damage Risk Analysis: HIS Risk Scoring Tool
- Other various Risk Analysis Tools

# Benefits of Risk Management

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## Risk transfer through appropriate insurance

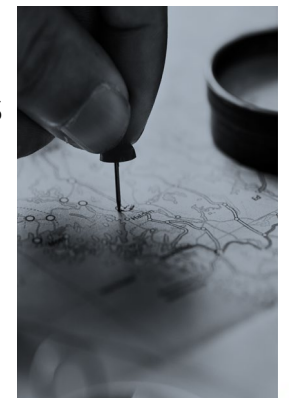
Effectively risk transfer through selection of appropriate insurance based on the analysis/evaluation of potential risks

- Prevention of risk transfer omission by selection of appropriate insurance item by risk
- Estimation of insurable amount based on probable maximum loss
- Term & conditions considered the characteristics of business

## Ensuring business continuity through accident prevention

Business Continuity without interruption by controlling the potential risks and preventing accident from business activity

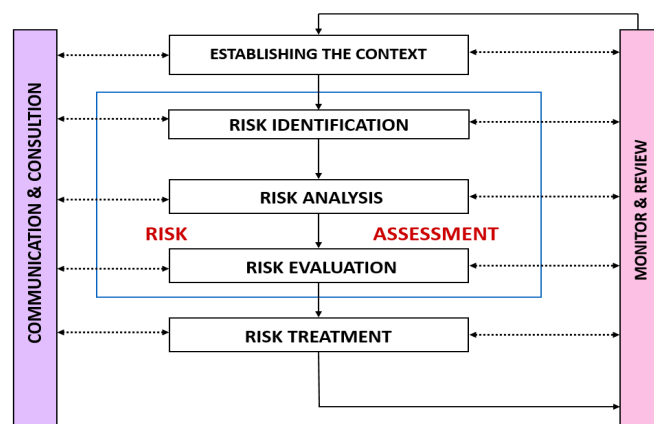
- Preventing accidents by implementing response plan by potential risk
- Ensure business continuity & quick recovery in the event of an accident
- Increasing external credibility through accident free



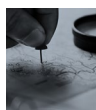
# Risk Management Service



Risk Management is an integrated process that identifies and measures the potential risks that may arise from business and selects/implements the best response to minimize the risk and continuously manages the processes and results to ensure a virtuous cycle.



RM Service of HIS Institute of Risk Management is based on the risk management process based on ISO 31000, and provides optimal RM Program for each site.



## Service contents

### Insurance Consulting

- Risk analysis and assessment for site
- Estimation of the PML for each accident scenario
- Calculating insurable value
- Consulting of term & conditions considered the characteristics of business

### Insurtech for RM

- Predictive analysis for possibility and severity of risk using Big data

### Natural Catastrophic Hazard Modeling

- Analysis of Natural Disaster using GIS technology

### RM Consulting

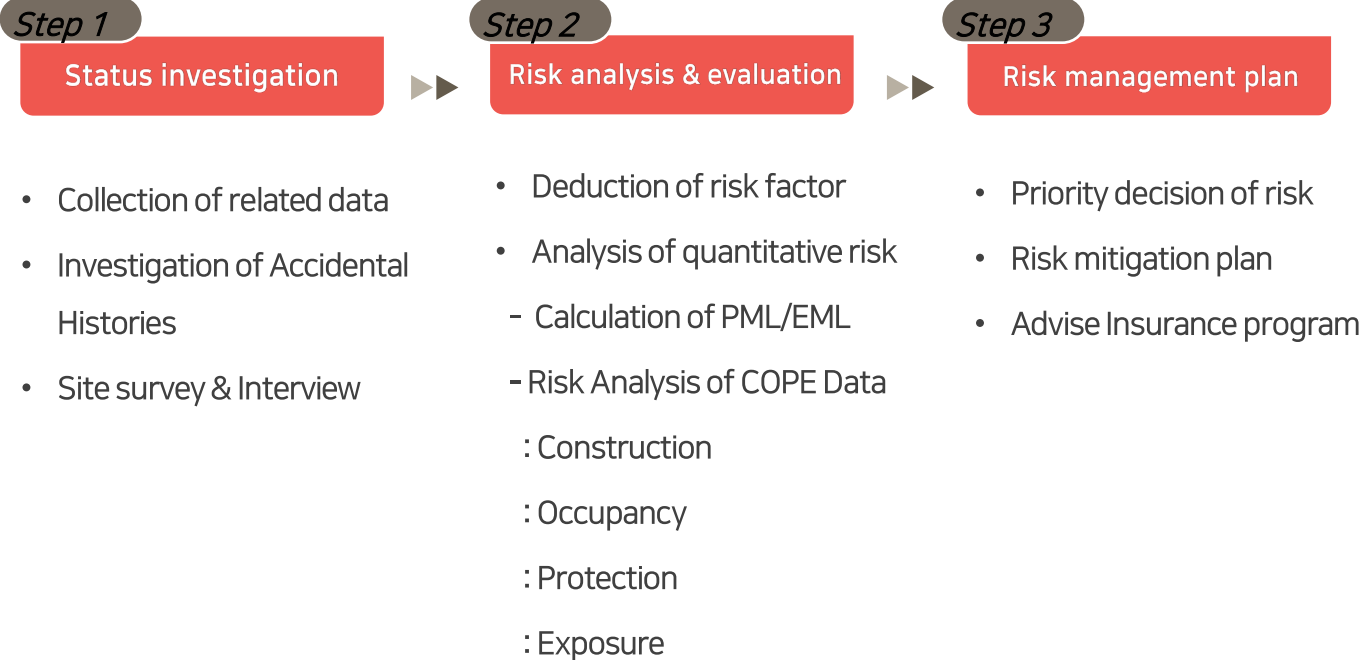
- Natural disaster risk assessment (Typhoon, flood, earthquake, lightning, etc.)
- Fire risk assessment
- Reliability evaluation of firefighting facilities
- Life safety consulting
- Safety inspection of construction site
- Slope stability analysis
- Common liability consulting
- Environmental pollution liability consulting
- Logistics risk consulting

# Appendix. Insurance Consulting Detail

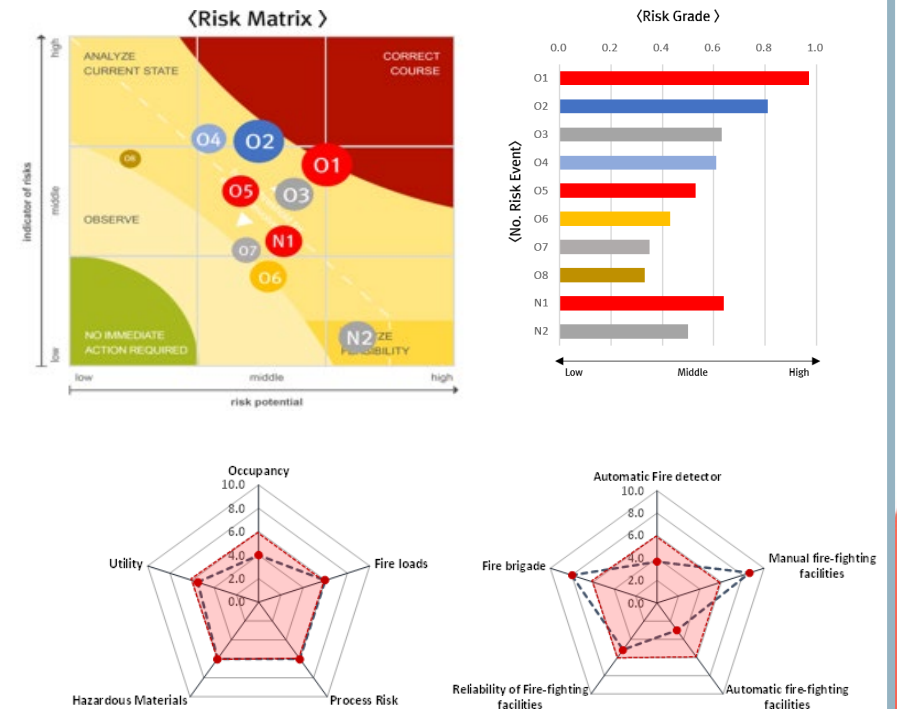
Let's talk *risk*.

HIS Institute of Risk Management analyze and evaluate the potential risks in business activity and advise reasonable insurance program. Furthermore, we provide risk management plan to prevent accidents based on a lot experience of accident handling of similar business.

## Risk Survey Process



## Ex. Risk Analysis



# Appendix. RM Consulting Detail

Let's talk *risk*.

Risk Management Consulting finally provides risk mitigation options after identifies/analyzes potential risks through site survey and interview, and the RM consulting is not only serviced at the operational phase but is continuously connected from the design and construction phases to the operational phase based on objective data and proven methodology.

## Service Area

Natural Hazard	Risk assessment of natural disaster such as hurricane, earthquake, flooding, and etc.
Credibility of firefighting system	Credibility evaluation of firefighting equipment considered occupancy and fire load of the site
Life safety consulting	Assessment and Improvement consulting of evacuation safety using fire and evacuation simulation
Safety inspection of arrester	Safety inspection consulting of lightning protection system based on international code
Safety inspection of construction site	Comprehensive consulting for potential risks such as human accident, structure collapse, third party liability that can occur during construction
Slope stability analysis	Stability analysis of cutting/banking slope during or after construction
Cost-Benefit analysis of RM plan	Cost-benefit analysis based on quantitative fire risk index of HIS by risk survey & analysis
Environmental liability consulting	Guideline of insurance program according to new act on liability for environmental damage and relief thereof
General liability Insurance consulting	Suggestion of risk mitigation strategy and calculation of estimated maximum loss based on analysis of each liability loss case
Risk consulting of logistics	Suggestion of improvement measures , to reduction the loss due to damage or theft of products during the storage or inland transportation

# Appendix. Insurtech for RM Detail

Let's talk *risk*.

HIS has been conducting various types of machine learning including Deep Learning using Big Data which is accumulated through our business. HIS forecasts accident and loss amounts, and suggests mitigation measures to minimize loss amounts.

## Risk Analysis Process by AI

Step 1

Construction of L/D

\* L/D: Learning Data

- Analysis of insurance data
- Analysis of loss data
- Analysis of survey data

Step 2

Design & Learning of Neural Network

- Selection of Input Data
- Set-up learning method (RNN, CNN)
- Design of Hidden Layer
- Selection of vitalization function (Sigmoid, Relu)
- Set-up Learning Rate, Classifier & Iterations
- Selection of renewal method to connection weight

Step 3

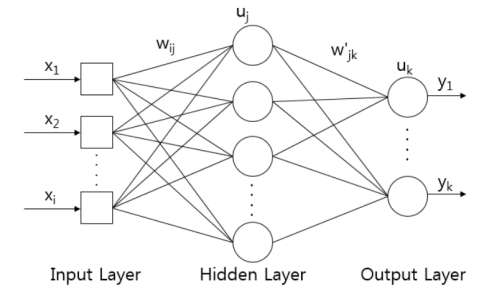
Risk Analysis

- Data collection
- Survey of loss history
- Site survey & Interview

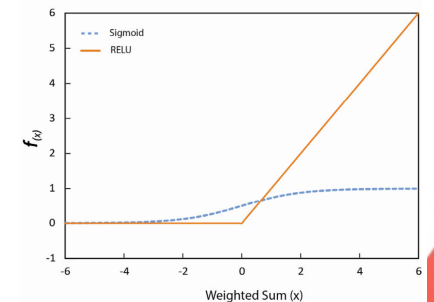
Step 4

Risk Evaluation

- Input neural network
- Forecast of loss type & loss amounts
- Countermeasure plan



<Structure of neural network>



<Comparison of vitalization function>

# Appendix. Natural Catastrophic Modeling Detail

Let's talk *risk*.

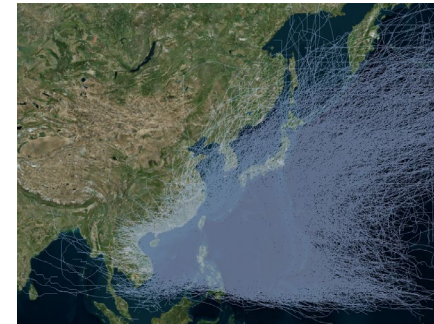
HIS forecasts loss amounts of insurer / insured by natural catastrophic hazard through Catastrophe Modeling based on GIS, and it provides effective counterplan. The loss amounts can be evaluated as generated scenarios or return periods, and it can be used as base data to calculate insurer's solvency or, risk-based capital of insured.

## Catastrophe Model Structure

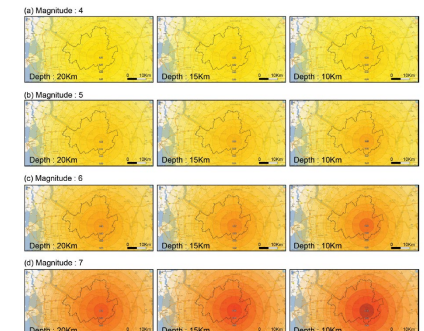
Catastrophe Model mainly consists of five Modules.

- 1) Event Generating Module : Generation of natural catastrophic event based on probabilistic & engineering method
- 2) Inventory Module : Construction of statue of assets' distribution, and characteristic of assets owned by insured
- 3) Hazard Module : Calculation of hazard severity when natural catastrophic event occur
- 4) Engineering Module : Evaluation of vulnerability at individual assets by hazard severity
- 5) Financial Module : Conversion from estimated damage size to loss amount, and calculation of return period & yearly average insured loss

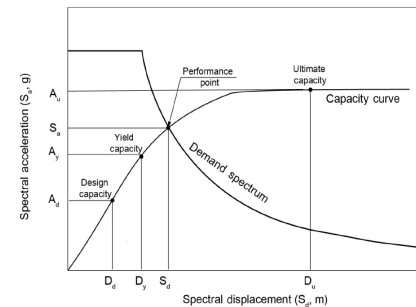
## Ex. Application of Catastrophe Model



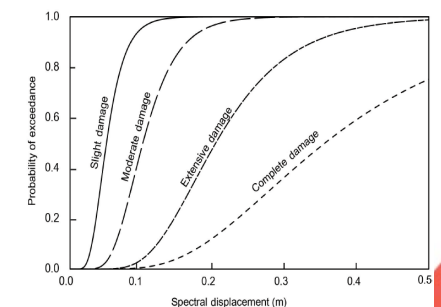
<Typhoon Event Generation>



<Earthquake Hazard Map Set-up>



<Performance curve at individual assets>



<Vulnerability Curve >