

PROPERTY INSURANCE

RISK QUALITY ASSESSMENT

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Introduction



Bachelor of Engineering - NED



ACII-Chartered Insurance Institute UK



Post Graduate HSE Certificate - NED



Process Safety Management - OGSC



Course Contents

- Phases of Risk Management
- Property Risk Assessment
- Risk Control Measures
- Major Industrial Hazards
- Causes and Fire Classification
- Active and Passive Fire Protection
- Calculation of Loss (Estimation)
- Features of Risk Assessment Report



Overview-Insurance Contract

Insurance is the transfer of risk to an insurance company, which pools the risks and provide indemnification who suffer covered losses.

“LOSSES OF THE FEW ARE MET BY THE CONTRIBUTIONS OF MANY”



Insurable Risks

- Almost all risks insured by insurance companies are pure risks
- Only risks involving financial loss are insurable

Insurance companies also do not insure against **PREDICTABLE LOSSES**, such as wear and tear, and inherent vice, which is the self-destruction of property caused by the nature of the thing itself, such as the rotting of fruit.



Phases of Risk Management

- Risk Identification
- Risk Assessment
- Risk Mitigation
- Risk Monitoring / Control





Risk Management Process (ISO 31000)





What is Risk?

- Risk can be defined as the combination of the probability of an event and its consequences (ISO/IEC Guide 73)
- A dictionary definition of risk is “the possibility of loss or injury”
- ISO 31000-Effect of Uncertainty on objectives



Risk &
Uncertainty



Probabilities and
expected outcomes
are unknown

Some knowledge
of probabilities
and expected
outcomes

Probabilities and
expected
outcomes are
known





Risk Perception:

Risk is not a physical thing: is it really possible to perceive it? Level of perceived risk is a subjective risk judgment based on:

Voluntariness

Controllability

Delay

Man Made and Natural

Familiarity

Expected benefit

Media



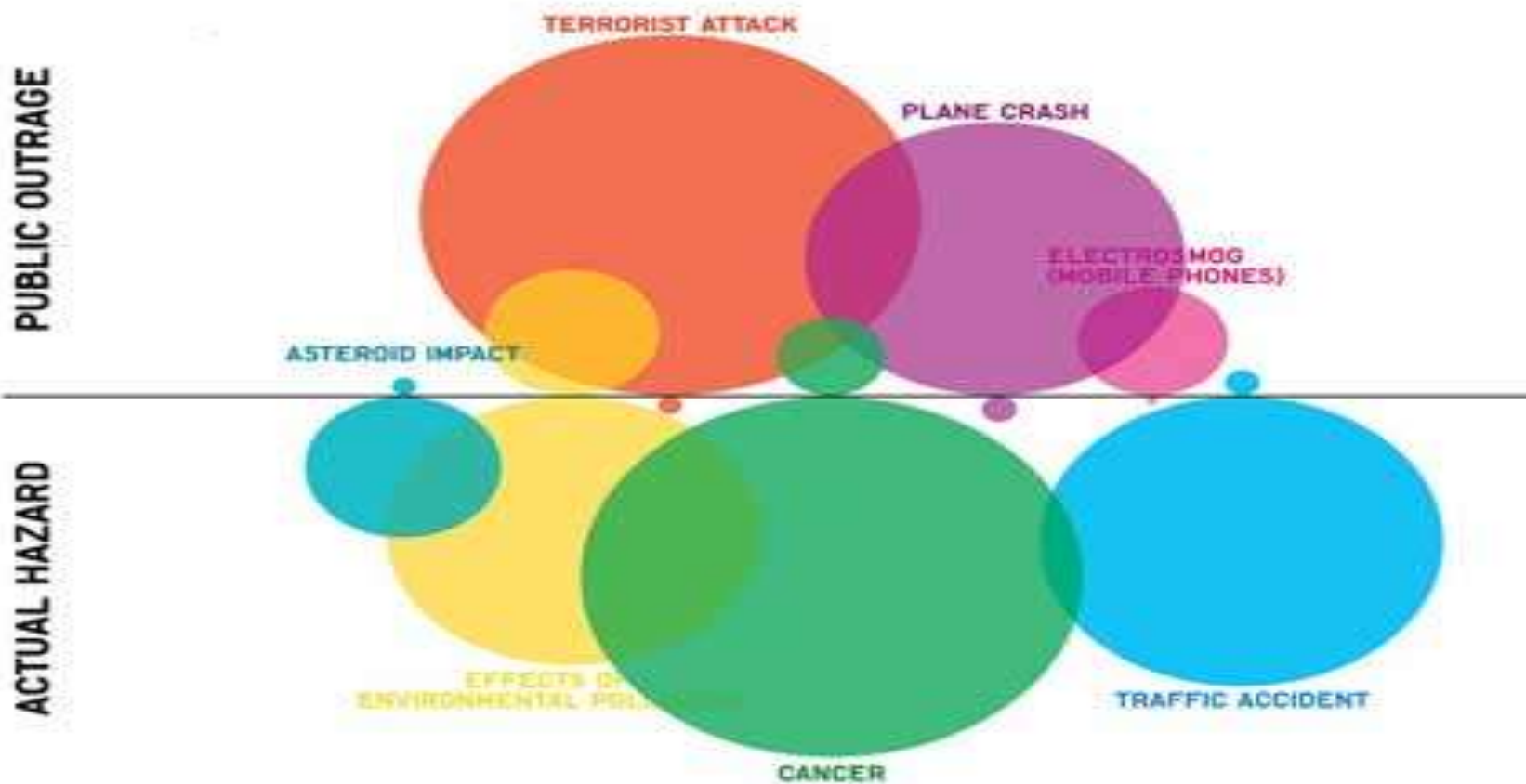
AON Global Risk Management Survey 2017

Top Ten Risks

1. Damage to reputation/brand
2. Economic slowdown/slow recovery
3. Increasing competition
4. Regulatory/legislative changes
5. Cybercrime/hacking/viruses/ malicious codes
6. Failure to innovate/meet customer needs
7. Failure to attract or retain top talent
8. Business interruption
9. Political risk/uncertainties
10. Third party liability



RISK PERCEPTION AND ACTUAL HAZARDS





Risk and Consequences



Red on yellow, kill a fellow. Red on black, won't hurt Jack.



Classification of Risk

- Financial and non-financial risk
- Pure and speculative risk
- Fundamental and particular risk





Other definition of Risk

“A risk is the threat that an event or action will adversely affect an organization's ability to maximize stakeholder value and to achieve business objective”





Other Definitions of Risk (cont.)

“Risk arises as much from the possibility that opportunities will not be realized as it does from the possibility that threat will materialize or that mistake will be made”.

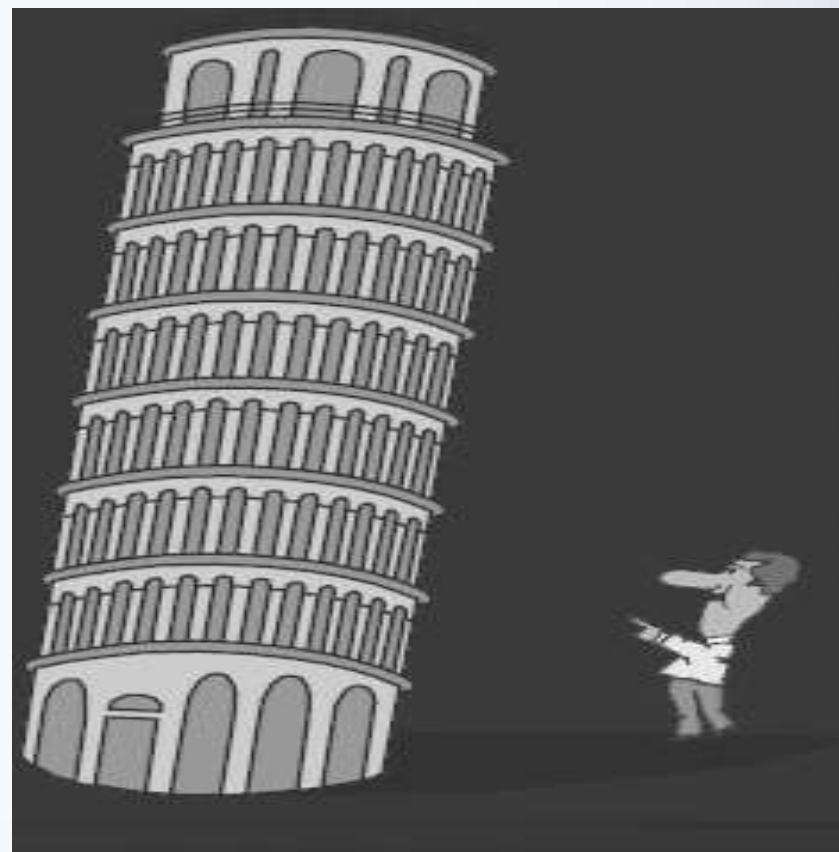
“Risk, however, is integral to all opportunity and is as much about opportunity as it is about threat”



Hazard

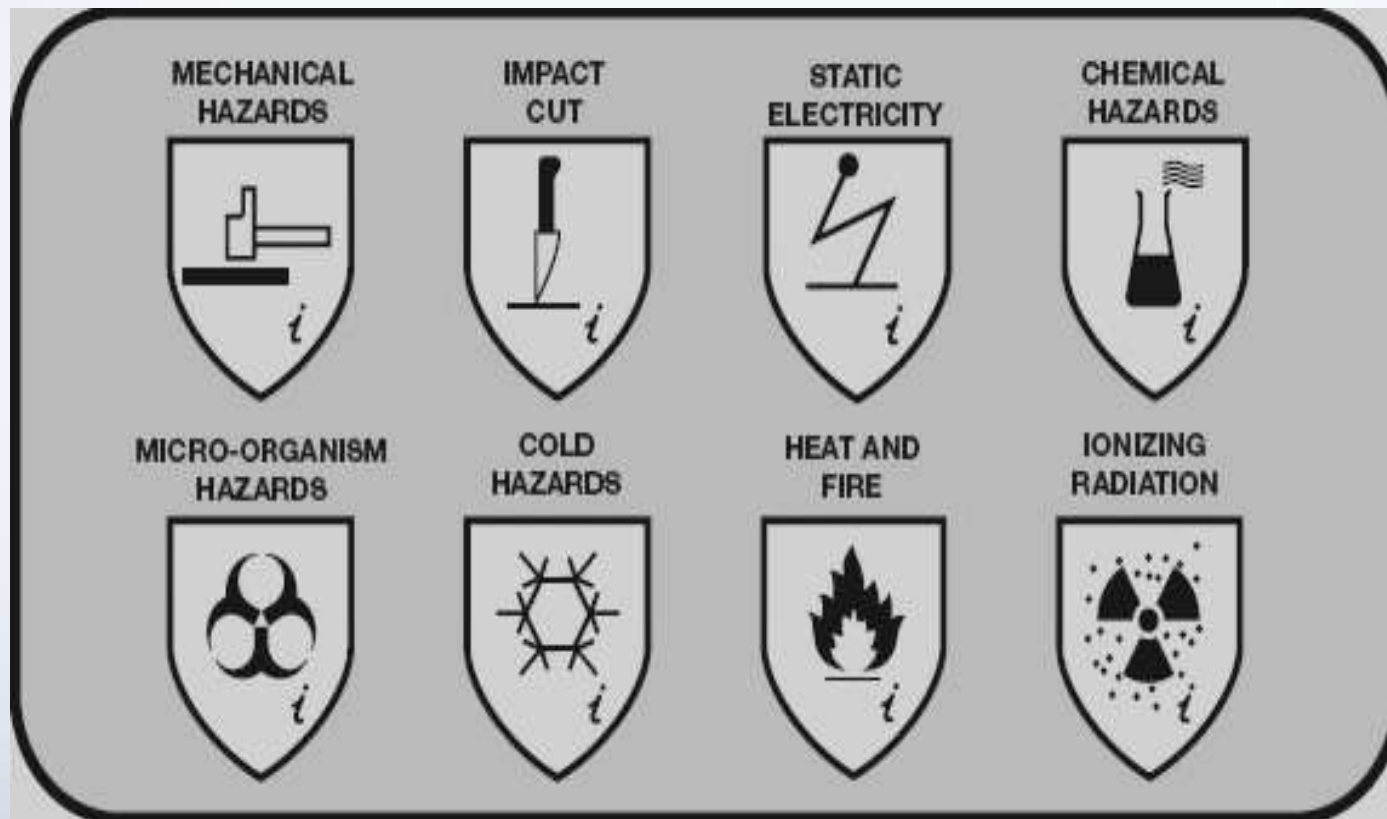
The terms 'hazard' is used throughout this presentation and it is important that you have a clear understanding:

- Act or Situation for harm
- Something with the potential to cause harm
- A hazard is a feature that might alter the frequency and severity of a peril occurring
- A hazard is not itself the cause of loss, but it can increase the effect of a peril and may make the operation of a peril more likely.





Causes Of Hazards





Overview- Property Risk Assessment

For a full risk evaluation of a facility (e.g. baseline visit), there are critical information should be gathered for the following four categories.

- Fire / Explosion Hazards
- Natural Disaster Hazards
- Human Elements
- Production Analysis



Identify Risk





Ways to Handle Risk





Methods of Risk Identification

Effective risk identification need to examine and processing various information's, with specific reference to:

- Organizational Chart
- Process Flow
- Checklist and Questionnaire
- Physical Inspection
- Fault Tree
- Hazard and Operability (HAZOP)



Risk Control

Preventative controls are designed to reduce the possibility of undesirable outcomes. They are measures to stop a risk happening or an unwanted outcome arising:

Examples:

- Separation of duties;
- Limit specified actions only to authorized personnel such as signing off of designs by qualified and trained personnel;
- Authorization of price quotations;
- Allowing only trained press officers within an organization to talk to the media thus avoiding unwanted publicity.



Corrective controls are measures to limit the scope for loss and reduce any undesirable outcomes that have already occurred. These controls are a means of recovery against loss or damage.

Examples:

- Continuity planning.
- Contract terms that allow a supplier to recover goods that have not been paid for from a customer whose business is in receivership or administration.
- Insurance as it facilitates financial recovery when an insured risk materializes.



Directive controls are instructions or regulation designed to ensure that a particular outcome is achieved. They are important when people's behavior can prevent an undesirable event. Directive controls are commonly associated with health, safety and security.

Examples:

- Operational instructions for machinery;
- Staff training to certain skill levels before being allowed to work unsupervised ;
- Requirement to wear protective clothing while performing dangerous duties;
- Checklists, worksheets and test schedules to ensure that all critical aspects of a task; have been properly addressed and completed.



Detective controls are designed to identify unwanted occurrences that have already happened and are, therefore, only appropriate when it is possible to accept the loss or damage incurred.

E.g.

- Stock or other assets checks to detect theft or anomalies;
- Reconciliation authorized payments with bank statements to detect unauthorized transactions;
- Audits and inspections and similar quality controls look for causes of defects in products and procedures, with a view to introducing changes in the future.



Fire Risk Assessment

The aims of the fire risk assessment are:

- To identify the fire hazards.
- To reduce the risk of those hazards causing harm to as low as reasonably practicable.
- To decide what physical fire precautions and management arrangements are necessary to ensure the safety of people / property at premises if a fire does start.



Fire / Explosion Hazards

Investigated flammable gases/liquids storage and their handling process







- Dust explosion hazards
- Gas fired equipment explosion hazards





- Construction Material Investigation
- Plastic ducts
- Plastic insulations (roof, wall panels and ducts)





Storage Configuration





Video: Fire Risk Assessment





What is a Fire?

Fire is a rapid oxidation of a material in the exothermic chemical process of combustion, releasing heat, light and various reaction products.

Fire Tetrahedron

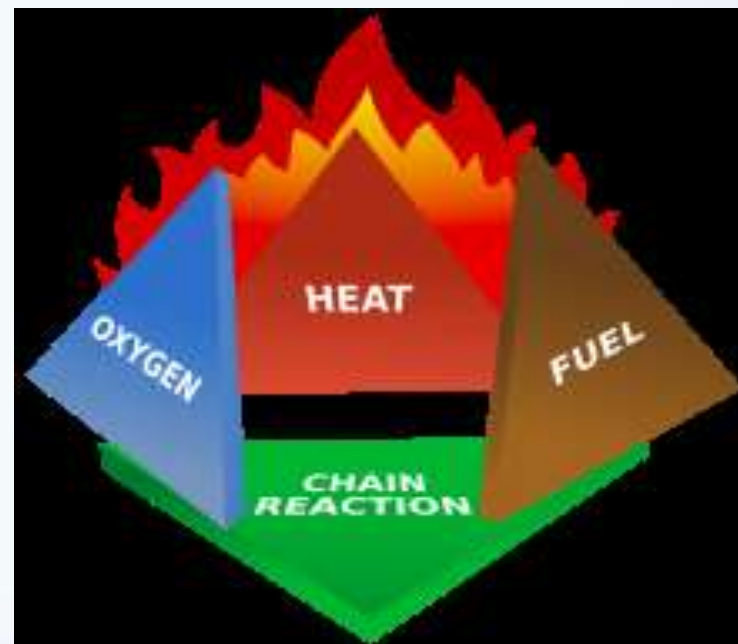
Once ignited, a chain reaction must take place whereby fires can sustain their own heat by the further release of heat energy in the process of combustion and may propagate, provided there is a continuous supply of an oxidizer and fuel.



Fire Triangle



Fire Tetrahedron





Causes of Fire

General Causes of Fire loss

1. **People**
2. **Process**
3. **Heating System**
4. **Lighting and Power Systems**
5. **Waste**
6. **Material**
7. **Trade Process**

Major Causes of Fire loss

1. **Heating and industrial process**
2. **Spontaneous combustion**
3. **Operating in or near flammable range.**
4. **Smoking**
5. **Electrical apparatus**
6. **Arson**
7. **Housekeeping**
8. **Contractor and application of heat**



Natural Hazards- Earthquake Exposures

- Fire after earthquakes
- Water damage after earthquakes
- Shake damages (Building, Storage, Equipment)



Photo courtesy of ABS Consulting.





Difference between:

- Flash point and Auto ignition temperature
- Flash point and Fire Point
- Backdraft and Flashover
- Flammable and Combustible Liquids



Structural Hazard

Consideration must be given to the extent to which design or layout may facilitate or restrict the spread of fire within a building and the degree to which building is exposed to risk from fire in adjoining or adjacent buildings.






A fire in a building / premises may spread from its point of origin either:

- Vertically
- Horizontally



Classifying Fire

When deciding on what fire protection is appropriate for any given situation, it is important to assess the types of fire hazard that may be faced

Class of fire	Symbol	Type of combustible material	Type of fire	Examples
A		solid, non melting materials	glow and flames	wood, paper, textiles, coal, non melting plastics
B		liquids and melting solid materials	flames	oils, solvents, waxes, melting plastics
C		Gases	flames	propane, butane, acetylene
D		Metals	glow	sodium, magnesium
E		A,B,C,D materials combined with installations charged with electric potential	glow and flames	electric motors, switchyards, transformers

Comparison of fire classes

American	European	Australian/Asian	Fuel/Heat source
Class A	Class A	Class A	Ordinary combustibles
Class B	Class B	Class B	Flammable liquids
	Class C	Class C	Flammable gases
Class C	Class F/D	Class E	Electrical equipment
Class D	Class D	Class D	Combustible metals
Class K	Class F	Class F	Cooking oil or fat



Identify the Fire Hazard

- Have you identified all potential ignition sources?
- Have you identified all potential fuel sources?
- Have you identified all potential sources of oxygen?
- Have you made a note of your findings?



Evaluate the Fire risk

The management of the premises and the way people use it will have an effect on your evaluation of risk. In multi-occupied buildings you need to consider the risk generated by others in the building.

To evaluate the fire risk to property / people at the premises, you will need to understand the way fire can spread. Fire is spread by three methods:

1. Conduction
2. Convection
3. Radiation



Assessment of Fire Protection

Fire protection is the study and practice of mitigating the unwanted effects of potentially destructive fires.

FP is achieved via:

1. Active Fire Protection
2. Passive Fire Protection
3. Education



Active & Passive Fire Protection

Active and passive fire protection systems, although different, are important to a premises overall fire safety..

AFP uses systems that take action in putting out the fire, while PFP uses systems that help prevent the spread of fire and smoke



Having identified the fire hazards now need to remove or reduce those hazards if reasonably practicable to do so:

- Remove or reduce sources of ignition
- Remove or reduce sources of fuel
- Remove or reduce sources of oxygen
- Enhance Fire protection measures
- Limit the area to trained staff only.
- Increase staff training and awareness.

The level of fire protection should be proportional to the risk posed in order to reduce the remaining risk to a level as low as reasonably practicable.

The higher the risk of fire , the higher the standards of fire protection will need to be



Human Elements

- Emergency response plans
- Hot Work System
- Fire protection inspections
- Smoking Control Policy
- Equipment maintenance programs
- Business Contingency Plans





Loss Estimation

- Helps Underwriters to decide how much (what proportion) of a risk they can retain, and whether they need to purchase reinsurance for their share of that risk.
- Estimation only based on experience, there is no exact formula that risk engineer use to arrive at this figure.



Loss Estimation (Cont.)

It is important that the assessment is neither excessively high, nor excessively low:

- If it is set too high, the Underwriters will be buying reinsurance cover that they do not really need, or retaining smaller shares of risks than they could otherwise hold. In either case, premium income and the potential for profit will be curtailed.
- If it is set too low, then rates could be set too low and there is an increased risk that the chosen figure will be exceeded by a loss, which also affects their profit/loss ratios and affects their credibility and relationships with their reinsurers.



Loss Estimation (Cont.)

Calculation of loss estimation is normally based on three distinctly different scenarios.

1. Maximum Foreseeable Loss
2. Probable Maximum Loss
3. Normal Loss Expectancy



Basic Considerations

Three questions must be addressed:-

1. What is at risk?
2. What is it worth?
3. How much of it is likely to be damaged, and to what extent?

Consider these variables

1. Building construction
2. Combustibility of contents
3. Susceptibility of contents
4. Public and private protection



Maximum Foreseeable Loss (MFL) Scenario

Potential damage caused by a fire starting in the most vulnerable area within a building or facility with all its active fire systems impaired or unavailable at the time of the incident.

Scenario assumes a “**free-burn**” until all combustible material throughout the fire area is consumed.

Additionally considered:

1. Potential business interruption loss exposure
2. Environmental pollution arising from the fire etc.



Normal Loss Expectancy (NLE) Scenario

The NLE (Normal Loss Expectancy) by definition is the “most likely” loss scenario and like the MFL and PML scenarios is based on a fire starting within the most vulnerable area of the facility, however, the NLE scenario assumes all available fire systems are in service at the time of the fire.



Maximum Probable Loss (MPL) Scenario

Maximum Possible Loss (MPL) is that which may occur when, the most unfavorable circumstances being more or less exceptionally combined, the fire is only stopped by **impassable** obstacles or **lack** of substance. (*CEA = Comite European des Assurances*)

Impassable obstacle means:

- Any space between buildings and / or
- Any obstacle

Which makes all propagation of fire (or the shock wave) impossible.



Factors to Reduces MPL Value

Following factors may contribute to a reduction in the MPL:

- Physical separation of buildings: compliance with minimum distance requirements.
- Structural separation of buildings: creation of fire zones using fire walls, compartments etc.
- Absence of fire load.



Purpose of Survey Report

Survey reports are intended to:

- Evaluate whether relevant specifications have been complied with
- Identify any unusual features which might influence an underwriter
- Provide more detail than an underwriting submission
- Make recommendations for risk improvements

A report which makes clear that a risk is of poor quality can cause an underwriter to:

- Refuse to offer terms
- Charge a higher premium
- Restrict cover



Case Study & Video: Fire From Ice





Quiz

