

Accidents don't happen – They are caused

INDUSTRIAL RISKS:

Risk Management, Key Underwriting Considerations

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Agenda

- ▶ Key process risks in heavy manufacturing & energy industries
- ▶ Risk engineering aspects, hazards.
- ▶ Detection, protection & loss avoidance systems
- ▶ Typical industrial accidents which trigger insurance claims
- ▶ Protecting human assets

Risk Engineering Considerations

- ▶ Type of raw materials or inputs
- ▶ Transportation and handling
- ▶ Storage of raw and finished materials
- ▶ Buildings and facilities
- ▶ Fire protection
- ▶ Housekeeping
- ▶ Security

Power Sector Risks & Hazards

- ▶ **Gas, Steam & Hydro Turbines**
 - ▶ Ruptures, High Cycle Fatigue, Blade failures, Design failures
- ▶ **Wind turbines**
 - ▶ Lightning, Electrical Fires, Gearbox failures, Remote locations
- ▶ **IC Engines**
 - ▶ Overheating, Lubrication failure, High speed equipment (Turbochargers), Fire
- ▶ **Generators**
 - ▶ Ruptures, Short circuits, Explosions, Fire
- ▶ **Transformers**
 - ▶ Explosion, Fire ,Insulation failures
- ▶ **Boilers**
 - ▶ Explosion , Fire

Steel Industry Process Risks

- ▶ Flammable liquids & gases
- ▶ Heat treatment
- ▶ Combustible metals & dust
- ▶ Spark erosion/ electrical discharge machining
- ▶ Hot work processes
- ▶ Electroplating
- ▶ Hazardous substances
- ▶ Pollution & environmental degradation
- ▶ Housekeeping

Risk Engineering Considerations

Natural Hazards

- ▶ Natural Catastrophes
 - ▶ Earthquake / Volcanic / Tsunami
 - ▶ Windstorm
 - ▶ Floods
- ▶ Fires
 - ▶ Conflagrations
 - ▶ Storage Tank Fires
 - ▶ Wildfires
- ▶ Explosions
 - ▶ Hydrocarbon / Chemical / Mechanical
 - ▶ Nuclear
- ▶ Pollution
 - ▶ Chemical
 - ▶ Atmospheric

Business Consequences of Industrial Accidents

- ▶ Delays in construction
- ▶ Loss of revenue
- ▶ Delayed startup
- ▶ Business interruption
- ▶ Losses to insurers / reinsurers
- ▶ Impact on renewal premiums

Detection, Protection & Prevention Approaches

- ▶ Use technology for early warning signs
- ▶ Investigate abnormal parameters and symptoms
- ▶ Hire & train qualified, experienced personnel to perform critical functions
- ▶ Analyze incidents to ascertain root cause
- ▶ Particular attention to repeat failures
- ▶ Take timely corrective actions
- ▶ Seek advice and guidance from manufacturers
- ▶ Review sops and modify
- ▶ Have adequate safety measures in place
- ▶ Fire protection and fire fighting systems as appropriate
- ▶ Have a formal accident reporting and accountability process
- ▶ Reward good performance

Accidents which trigger Insurance Claims

Examples from Pakistan - 10 years

- ▶ Flood damage to steam power plant - USD 30 million
- ▶ Gas turbine compressor failure - USD 16 million
- ▶ Hydro dam under construction washed away - USD 10 million
- ▶ Warehouse fire - USD 7 million
- ▶ Textile mills fire - USD 7 million
- ▶ Oil refinery furnace explosion - USD 7 million
- ▶ Cement plant raw material silo collapse - USD 9 million
- ▶ Power plant 400 mva transformer failure - USD 27 million

Some of the examples cited had substantial business interruption exposure



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