

A photograph of a complex industrial facility, likely a power plant or refinery, featuring a dense network of large, insulated metal pipes, valves, and machinery. The scene is brightly lit, highlighting the metallic surfaces and the intricate layout of the equipment.

# **RISK ASSESSMENT: METHODS AND PRACTICES**



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# RISK ASSESSMENT: METHODS AND PRACTICES

## *Contents*

- Risk assessment: the process
- Hazard identification: what to look for?
- Risk assessment: tools and methods
- Good to know: practices

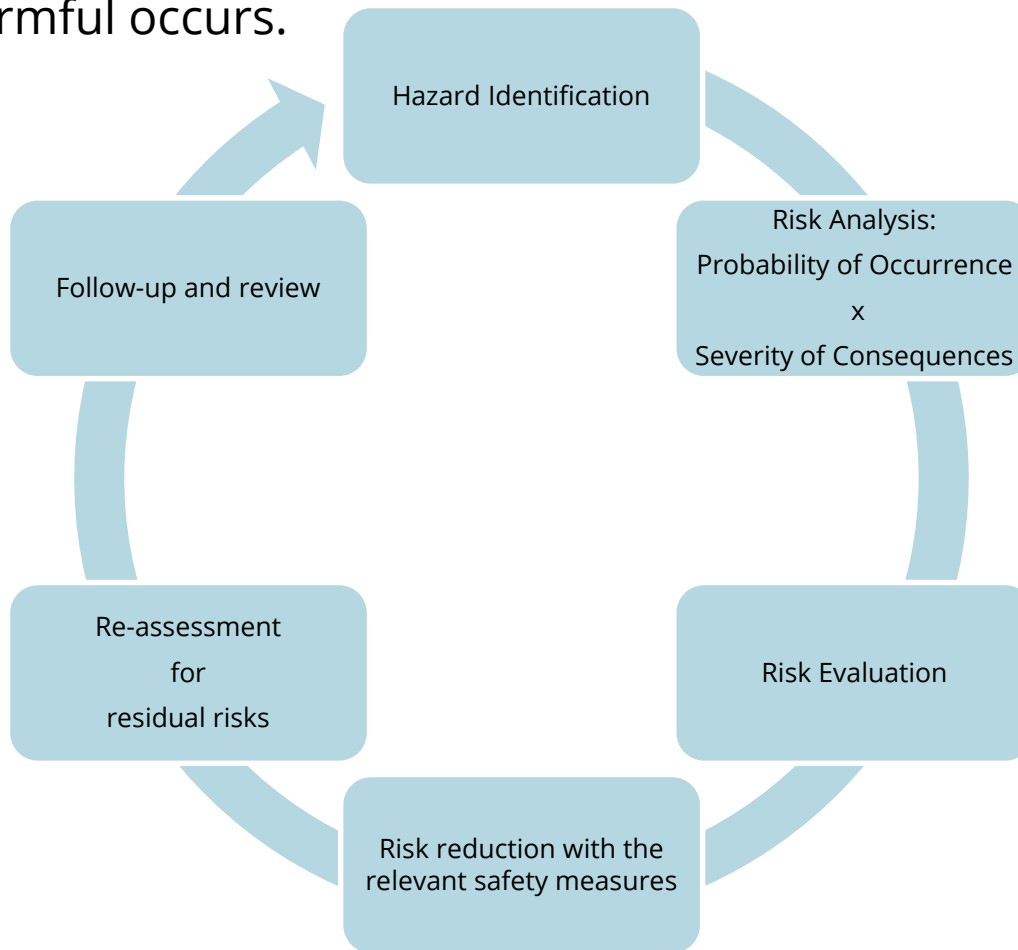
*An iceberg is a metaphor for accidents and their causes. The upper level (above water) describes the evident accident causes, while most of the contributing factors are hidden beneath the surface. There are multiple hidden/unidentified causes towards each outward/identified factor.*



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# RISK MANAGEMENT

- Risk management is a continuous process, the aim of which is to identify, reduce, minimize or eliminate those factors that can cause harmful consequences (such as accidents, diseases, economical losses etc.)
- In the best case scenario, accidents and incidents are prevented before anything harmful occurs.



*This model is generic and can be applied to all types of risks: health & safety, fire, property damage, cargo losses, etc.*



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# HAZARD IDENTIFICATION

*What and why?*

Hazards may be concealed in:

- 1) Management, supervision and everyday practices
  - 2) The operating environment, e.g. in technologies, tools and processes
  - 3) Human performance: performance may vary from that which was intended
    - Unintentional
    - Intentional
- These kinds of hazards can be identified using different methods
  - The methods ensure a systematical and holistic approach to the risks
  - To make a risk assessment, continue hazard identification with estimation of
    - Probability of occurrence
    - Severity of consequences



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# HAZARD IDENTIFICATION

*Hazards can be obvious or hidden – see the two theories below*

## Active errors and latent conditions:

- An "Active error" refers to a human performance, that contributes to an accident/incident
- "Latent conditions" are factors, that are hidden in the operating/working environment enabling an accident to occur
- Weaknesses in management practices and supervision are also accident contributing factors, i.e. latent conditions

*Introduced originally by James Reason  
(Managing the risks of organizational  
accidents, 1997)*

## Accident carriers and barriers:

- Accidents are **promoted** by, e.g.:
  - hazardous conditions,
  - inadequate technology (e.g poor usability, deficiencies in safety),
  - poor working and management practices,
  - A poor safety culture: disregarding safety, etc.
- Accidents are **prevented** by, e.g.:
  - Technical safety solutions
  - Target-oriented safety management
  - Good safety practices

*Introduced originally by Erik Hollnagel  
(Barriers and accident prevention, 2004)*



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# HAZARD IDENTIFICATION

*Where and how to look for?*

*You may need to identify hazards regarding all operations in your company. In order to decide where to start, you should e.g. check the accident/incident statistics, discuss with your/the employees or ask yourself, what "keeps you up at night?". You can also consult If.*

## Starting points, for example:

- History of accidents / incidents: where and how have they occurred before in your company?
- Are there tasks or processes that are
  - Perceived as being risky/hazardous
  - Seldom/infrequently carried out
  - Totally new, **and/or** involve new or inexperienced workers
- Audit reports and other documents concerning your operations and safety can also help to target hazard identification



# RISK ASSESSMENT - METHODS

*Risks vary, so should the methods.*

## The methods can screen risks that:

- Concern company operations / tasks / personnel / single individuals, etc.
- Can be realized:
  - Immediately, e.g.: accidents, acute sicknesses, psycho-social overload
  - Over time, e.g.: issues relating to well-being at work, physical ergonomics, etc.
- **A good practice** is to use more than one method to achieve a holistic overview of the risks, for example:
  - 1) Start with a general assessment
  - 2) Supplement it with a more detailed analysis of the most important findings in detail
- On-site observations and discussions with the employees (and other possible stakeholders) can **improve and fulfil** the assessment



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# RISK ASSESSMENT - METHODS

*Different methods for different needs*

*You can consult your local OHS authority or If to choose the most suitable methods of risk assessment. There are various methods, even with country-specific adaptations, available.*

## Various focuses, such as:

- The work environment in general: e.g. focus on the entire factory
- A detailed assessment of the working environment and operating conditions: a more limited focus on certain functions
- A machinery safety analysis: individual machines or machine systems
- A task-specific risk assessment: focus on a single task or function
- Scenario models, e.g. "What if...", worst case scenarios, etc.



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# PRACTICES

## *Good to know*

- Start with hazard identification
  - **Only identified hazards can be eliminated/managed**
- Assess risks on a regular basis (see your country-specific legislation and/or other instructions in your company)
  - Fulfil it frequently – re-assess when when necessary
    - E.g. in the event of new functions, machinery, routines, etc.
    - Note also new sites, if your company operates also in other facilities than your own
- Consider risk assessment as a continuous process, in which all of your employees can be involved!



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