Risk Management and control of exposure

SAIOH 2019 PDC 15th of October,
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Part 5 – Monitoring / Barrier management

PREPARED.

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Barrier management

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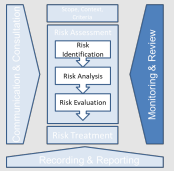
Monitor Condition of barriers



Risk Influencing factors:
Quality of tests
Maintenance of barriers
Roles & responsibility
Non conformances
Management system
Permit to Work

Major Accident

Prevent

- Layout
- Explosion barriers
- Ship collision
- Structure
- Cranes
- Contain-ment
- Process Safety
- Well Integrity
- Gas Detection
- Fire detection
- ESD
- CCR function
- Ventilation
- Ignition Control

Limit consequences

- Open drain
- Pressure relief
- Active Fire Prot.
- Passive Fire Prot.
- Emergency Power
- Alarm/ Comm.
- Escape
- Evacuation
- Rescue

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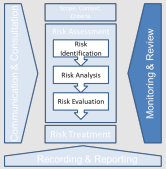
Monitor and Review

Operational Indicators



- Reported Incidents on critical equipment
- Maintenance management
- Barrier functionality
- Management review
- Management of Change
- Organizational structure/benchmarking
- Competence Management
- Overtime
- Turnover
- Culture

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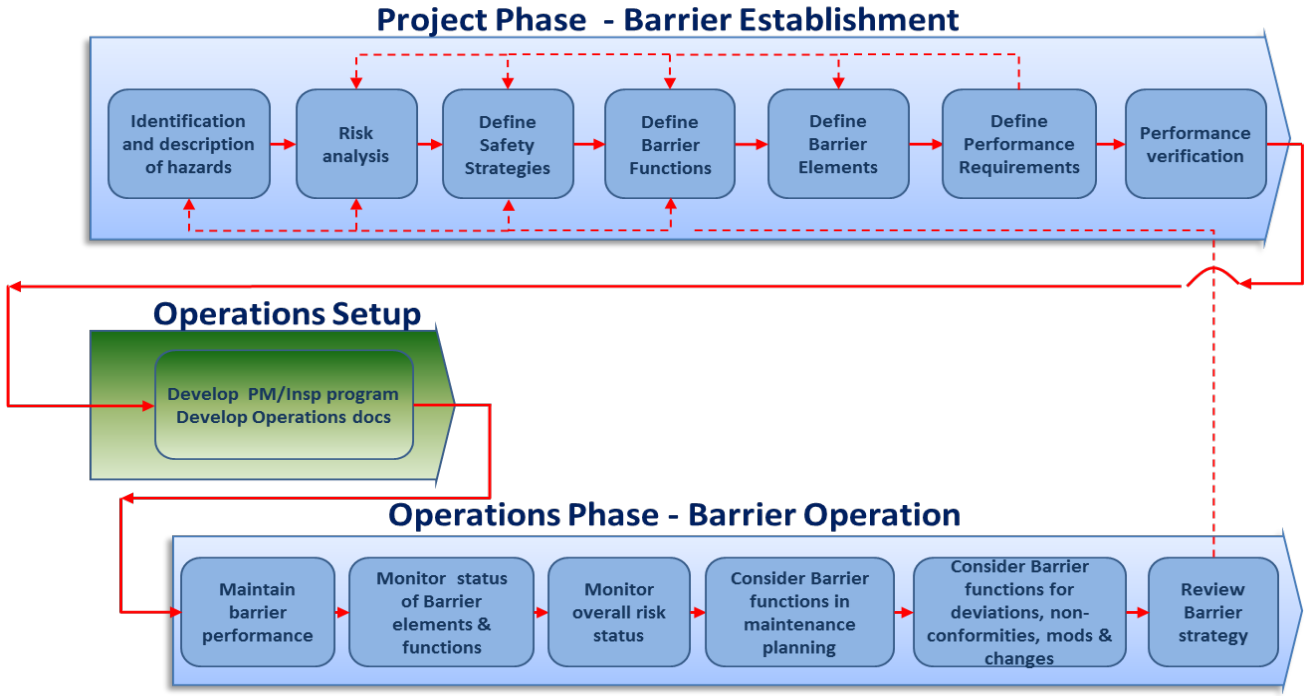
Barrier management – generic process



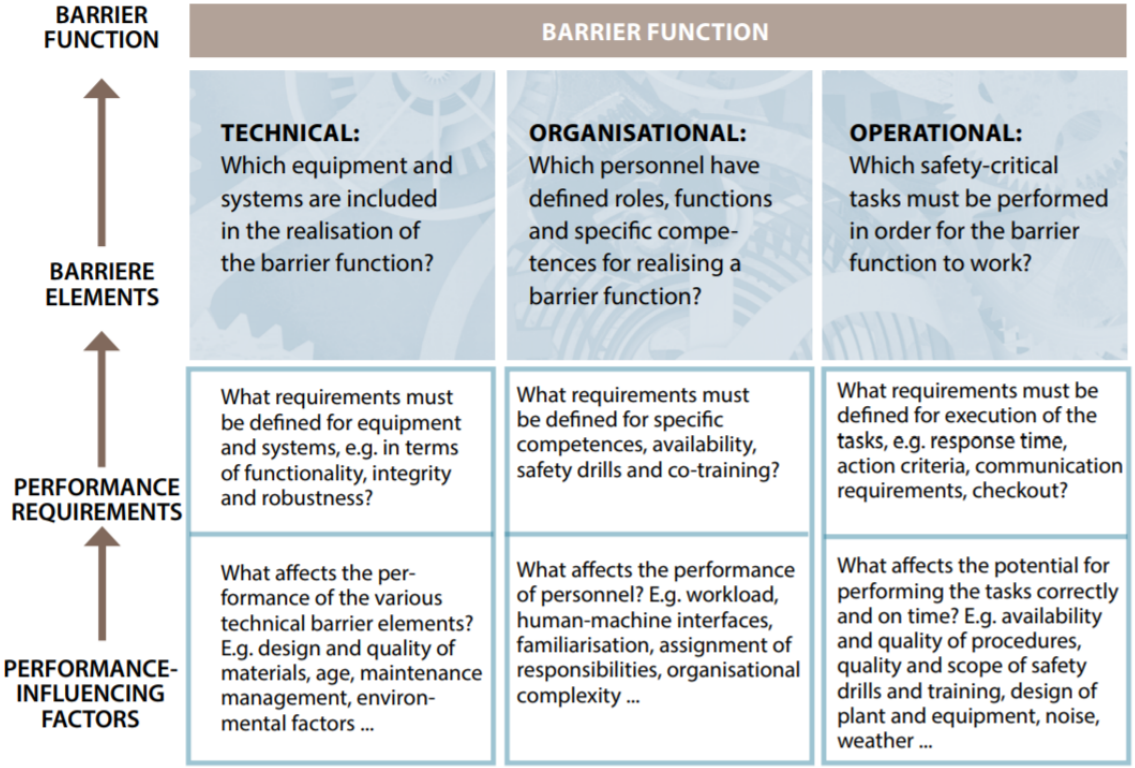
Challenges ?

- Dependencies between systems
- Technical, operational and organisational elements
- From project phase to operation
- Life time extension
- Complex system

Barrier Hazid

- The starting point for the risk assessment is to identify hazards and the accidental events relevant for the design and operation of the facility (entire facility or certain assets to be considered).
- Barrier management focus on specific types of hazards, e.g. hazards with the potential of causing major accidents, hazards that may lead to work related illness (e.g. due to exposure, noise, chemicals) or hazards that may cause severe damage to the external environment
- In the context of barrier management the hazard identification process is named Barrier HAZID.
- In order to assess the various hazards associated for a facility, several Barrier HAZIDs will be required in the life time of a facility.
- The structure of the Barrier HAZID should preferably be area based, but for some cases it may also be phase or operation based.
- The identified hazards and accidental events need to be kept updated during the lifetime of the facility. During project development, need for updates are typically introduced by changes in the design or maturation of the project. During operation modifications, new activities and new

Barrier management



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Barrier elements

Who does **what** with what type of **equipment** ?

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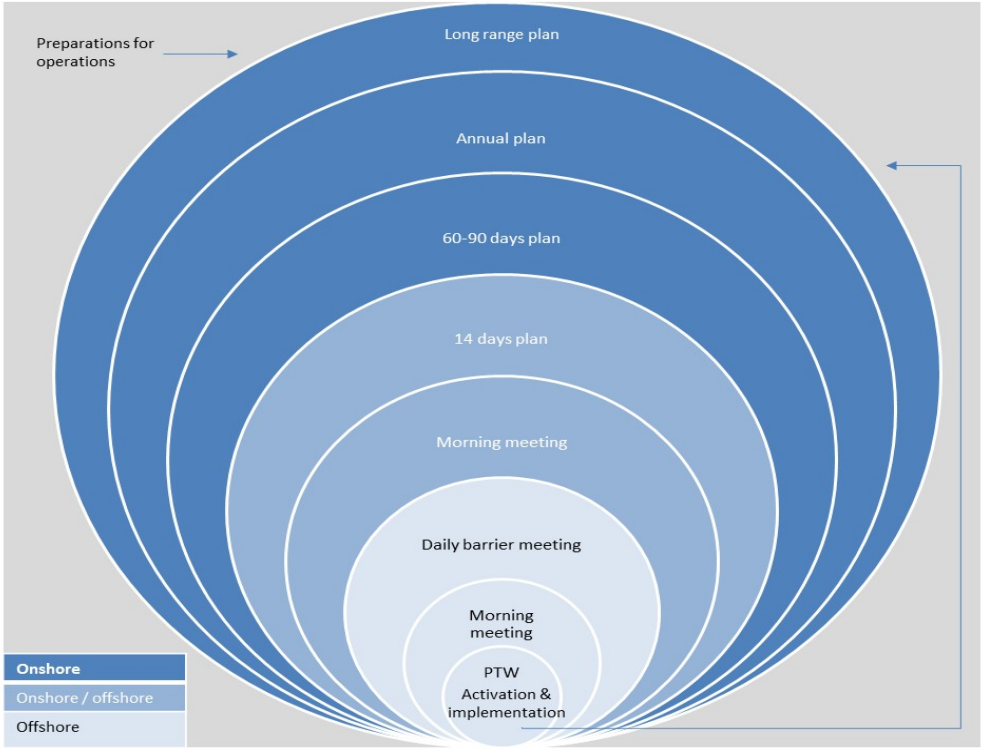
What decision should you support ?



- Day to day operational support
- Maintenance planning
- Long term planning/modification

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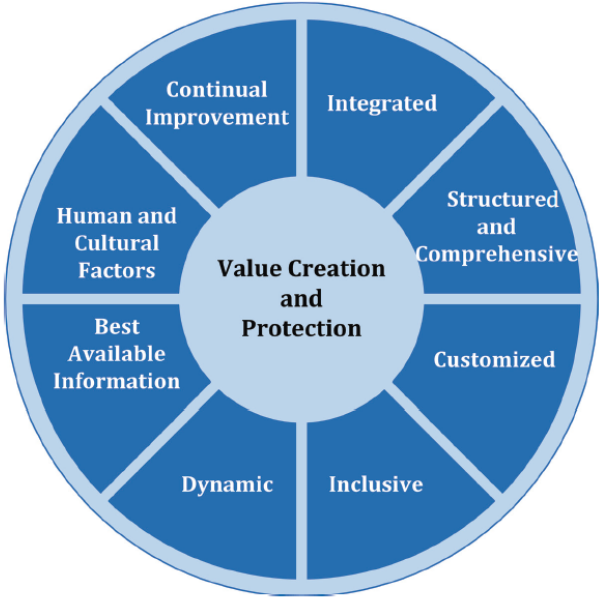
Key principles for effective risk management

- Risk management is an **integrated** part of all organisational activities
- A **structured and comprehensive** approach to risk management contributes to consistent and comparable results
- The risk management framework and process are **customized** and proportionate to the organisation`s external and internal context related to its objectives
- Appropriate and timely **involvement** of stakeholders enables their knowledge, views and perceptions to be considered. This results in improved awareness and informed risk management
- **Dynamic**; Risks can emerge, change or disappear as an organisation's external and internal context changes. Risk management anticipates, detects, acknowledges and responds to those changes and events in an appropriate and timely manner
- The inputs to risk management are based on historical and current **information**, as well as on future expectations. Risk management explicitly takes into account any limitations and uncertainties associated with such information and expectations. Information should be timely, clear, and available to relevant stakeholders.
- **Human behaviour and culture** significantly influence all aspects of risk management at each level and stage
- Risk Management is **continually improved** through learning and experience



Leadership

- Ensure that risk are adequately considered when setting objectives
- Understand the risk
- Ensure that systems to manage risk are implemented and operating efficiently
- Ensure that information about the risks and their management is properly communicated

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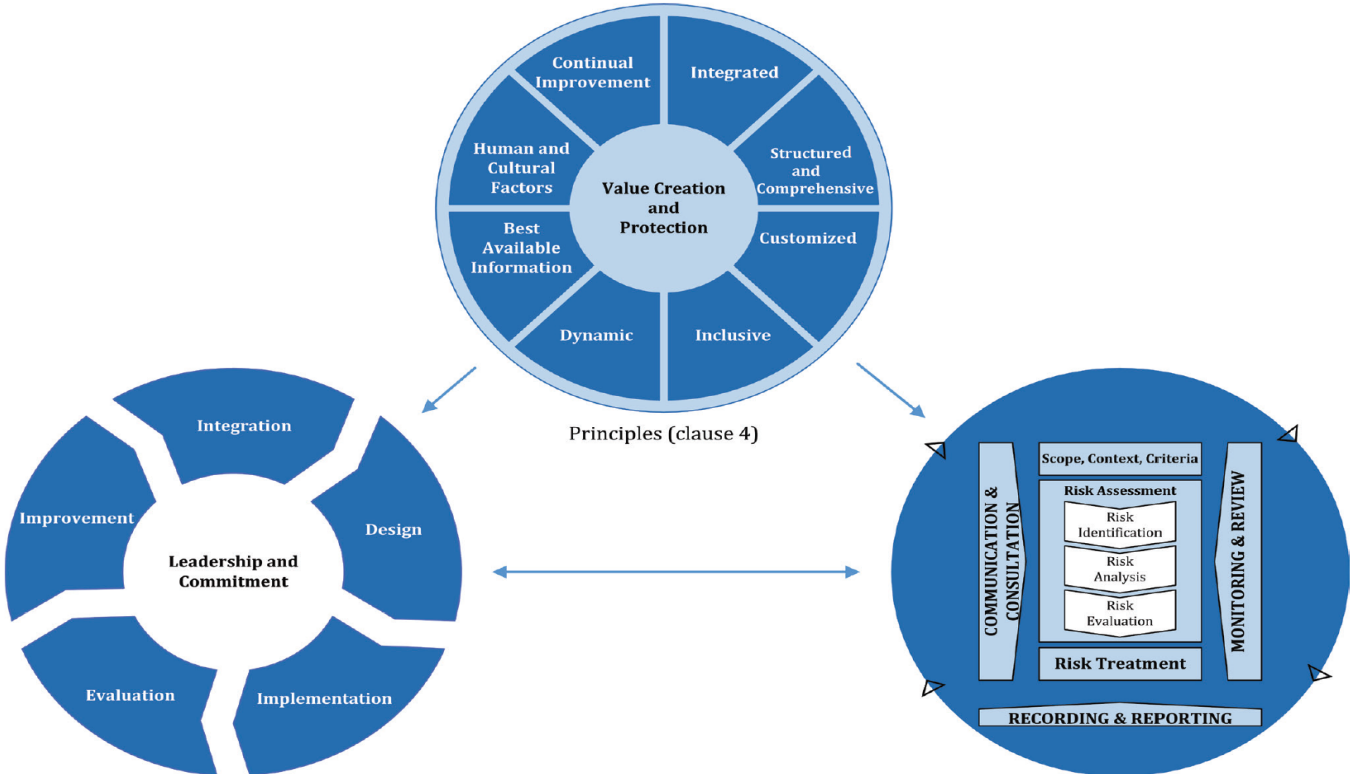
Principles, Framework and Process for Risk management



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