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Applied Risk Management: A Company Perspective

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Strategies to manage risk can be divided into three categories:

1. Risk assessment
2. Robustness, resilience, cautionary/precautionary thinking
3. Dialogue, interaction, participation

[Terje Aven]
Aspects of risk assessment
Risk assessment and risk management in my application area is unique.

Many challenges are in common.

- Challenges
- Good practice
- Success criteria
Two rules which I will never compromise

**Risk assessment principles:**

1: Understand the system you are analysing

2: Explain risk results based on the real world, not abstract terms
Risk assessment principles:

1: Understand the system you are analysing

2: Explain risk results based on the real world, not abstract terms
Which argument do you prefer?

Risk assessment principles:

1: Understand the system you are analysing

2: Explain risk results based on the real world, not abstract terms

A: The barrier is recommended because it reduces the risk from «red» to «yellow»

B: The barrier is recommended because it prevents people being hit by a car
Two useful concepts when entering a new application area
Useful concept #1: Risk management process

[ISO 31000:2018: Risk management]

"General recipe"
Challenge:
Different education/background
Different responsibilities
Different standards

But they all talk about risk
Different contexts

Different risk analysis methods

“General recipe”
Provides one general «recipe» that can be applied to any part of the organisation.
Management system

- Vision & values
- Strategy and governance
- Policies and processes
  - Management processes
  - Core processes
  - Support processes

Best practice, guidelines and tools

«Organisation recipe»/ procedures:
- How...
- When...
- If...
- When to carry out risk assessments?
In this way the «general recipe» can be applied to any risk informed decision.
Useful concept #2: The bow tie model

“Scenario mindset”
A model is a simplification
Too simple? Yes, probably
Covers some parts of the puzzle

Simple and intuitive way to see different safety initiatives relative to each other

Effective way to communicate safety aspects to non-safety people

It is only a model
Useful concept #1: “General recipe”

Useful concept #2: “Scenario mindset”

Provide a structure
Use of risk assessment - maturity levels

- Actively used management tool (structure, competence and culture)
- Integrated part of enterprise management (structure and competence)
- Required in management system (structure)
- Conducted prior to decisions
- Conducted when requested [Proactima]
Tolerability of risk –
the use of risk acceptance criteria
We are planning a new facility. How can risk assessment help us to ensure a safe design?

We have designed a new facility. Now we need a risk assessment to verify that the design is acceptable.

Generate alternatives
Compare risk
Emphasise differences
Highlight uncertainties
Suggest alternatives

Yes? No?
Example from Norwegian oil and gas industry

Examples:
- FAR < 10
- $P(\text{impairment of safety function}_i) < 10^{-4}$

Quantitative risk acceptance criteria

ALARP

Strong focus on risk calculation results relative to risk acceptance criteria
Can risk acceptance criteria (unintentionally) push decisions from risk informed to risk based?
Risk governance
Planlegging
Risikovurdering
Risikohåndtering

Top - Middle - Tail Concept
Relative Effort Expended
Typisk
risikoanalyse
Balansert
risikoanalyse

Communicate Results Effectively
Develop Cost Effective Solutions
Investigate Mitigation Alternatives
Calculate Risk Results
Estimate Failure Frequencies
Undertake Consequence Calculations
Identify What Can Go Wrong
Collect Relevant Information
Educate Client in Details of Study
Establish Client Needs

Context
Risk assessment
Risk treatment

Typical
More balanced
Perform the risk assessment twice

1) **Planning phase**: Simulate risk assessment to build confidence that what you get out of it will provide useful decision support

2) **Execution phase**: Carry out the risk assessment as planned

Never skip step 1
Hazard identification - common approach

Physical areas:
1) Area 1
2) Area 2
3) Area 3
4) ...

Activities:
1) Activity 1
2) Activity 2
3) Activity 3
4) ...

List of guide words:
• Technical condition
• Weather and climate
• Energy
• ...

List of hazards
Alternative approach: Start with identifying what is unique for this particular system.

What is unique for this particular system?

Dig into unique areas to identify potential hazards.
Dig into the characteristics

For unique characteristics: A more comprehensive hazard identification
Physical areas
Activities
Guide words

or...

Unique characteristics
Techniques for “creative thinking”

1. to study parts of the system one by one
2. to use a check list or a list of guide words
3. to identify the risk sources
4. to present the system’s characteristics graphically
5. to invent or create failures on purpose
6. to identify special/abnormal system’s characteristics

Example: AFD framework [Stan Kaplan]
Characteristic: The car has only three wheels

If we wanted the above characteristic to cause an accident. How could we do it?
Concluding remarks
If you are a decision maker

What are the decision alternatives?

How is the risk assessment going to provide decision support?

How do you need the risk results to be presented to provide decision support?
If you are a risk analyst

What are the decision alternatives?

Planning is everything. Don’t use a hammer just because you have one

What is unique with the system you are analysing?
If you a researcher developing risk analysis tools

Understand how your tool is going to be used

A brilliant tool is not brilliant if it is unfit for purpose
ARMSG: Applied risk management specialty group

«ARMSG is focused on the practical issues of risk management, as distinct from advanced analytical approaches to risk analysis. We believe that those practical issues can often make more difference in what risks are incurred than advanced analytics can». [John Lathrop, Chairman of ARMSG]

Applied risk management guidelines:
- Webinar October 24
- Roundtable in New Orleans

http://www.sra.org/armsg
Researchers: Like new ideas
«What is new about this»

Companies: Like proven concepts
«How is this compared to what other companies do?»
Comments or reflections?