

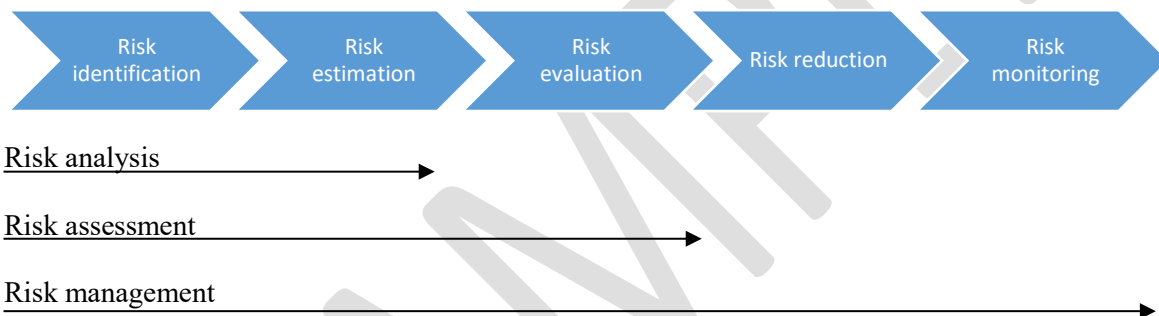
Risk management

Background and purpose

As part of systematic work environment management, risk management is an important instrument for identifying hazardous circumstances before these lead to accidents or illness.

The Swedish Work Environment Authority's provisions on Systematic Work Environment Management (*Systematiskt Arbetsmiljöarbete*, AFS 2001:1) state that "the employer shall regularly investigate the working conditions and assess the risks of illness or accidents at work".

The term risk management encompasses a number of operations (see below). The first operation is the risk analysis, which decides the boundaries of what is to be investigated but also identifies risks and estimates their likelihood and consequences. After this analysis risk evaluation is carried out, with the risks being divided into different categories depending on how serious they are. These two elements – risk analysis and risk evaluation – are often referred to as risk assessment. The next step is to reduce the risks. All of the steps together are known as risk management.



Risk management is to be carried out:

- on all normally occurring operations within the company
- ahead of major changes in methods and ways of working
- on the introduction of new equipment or alterations to equipment
- ahead of new drilling projects

Method

The most suitable method is chosen depending on what is to be analysed. Different methods are used for, say, analysis of a machine, start-up of a new project, an operation or premises.

Risk management involves a group of people systematically going through the relevant tasks and gathering experience and knowledge concerning the risks, problems and opportunities for improvement that exist.

Analysis object and methodology

In principle, the analysis object can be anything whatsoever: a task, a job role, a machine or other technical device, a production sequence or a method. One very important thing is to draw boundaries and not take on too large an area for analysis. Each analysis object should be split up into smaller sections (suboperations).

The general methodology is to identify and describe the analysis object carefully and to define its boundaries.

Prepare the work by producing information concerning previous accidents, near-misses and reported industrial diseases associated with the analysis object. There must be job instructions, rules/regulations and drawings.

Near-misses and accidents often occur when people feel their way forward, possibly under stress, to get a machine going that they are not used to, or when there are no routines or equipment. Where there are any psychosocial risks must also be investigated.

Analysis of a drilling project

Risk management is to be carried out before each start-up of a new drilling project. As support, a number of risks are listed in [Appendix 3A](#) ("Examples of risks in exploration works"). Use this as support when identifying the risks inherent in the various operations that make up the drilling project, i.e. from establishment through drilling to removal. Do not forget what can happen in the event of faults. There are also work situations and operations that occur rarely and these must not be forgotten either.

The various elements of the drilling project and any associated risks identified are entered in a risk assessment document – see [Appendix 3B](#) ("Risk assessment for drilling project").

Analysis of a work task

When a task is to be analysed, the possibility of the task having any risk of damage is investigated. Use the project risk assessment template ([Appendix 3B](#)) and describe there the task and any risks of damage identified. Try to break down the information into smaller suboperations if the task is general.

Analysis of a machine

A check list is used when a machine is to be analysed – see [Appendix 3C](#) ("Risk assessment for work equipment according to AFS 2006:4"). This is actually made up of two lists: a check list for work equipment and a template for risk analysis of machinery. The risks identified, i.e. where the questions in the various check lists have been answered either *NO* in [Appendix 3C](#) or the question has not been able to be answered with *OK* in [Appendix 3C](#), are to be entered in the document "Risk assessment for project" ([Appendix 3B](#)).

Risk estimation and risk evaluation

Once risk identification is complete, the risks must be estimated and evaluated. Each identified risk is then assessed as regards how often it is assumed to occur, i.e. likelihood, and how great a consequence (or how much damage) it may generally have. Here historical events are of great help in the assessment, i.e. previously reported risks, near-misses and accidents. Use these together with the participants' experience and "common sense" and the table ("interpretation guide") below when estimating the risks to produce values.

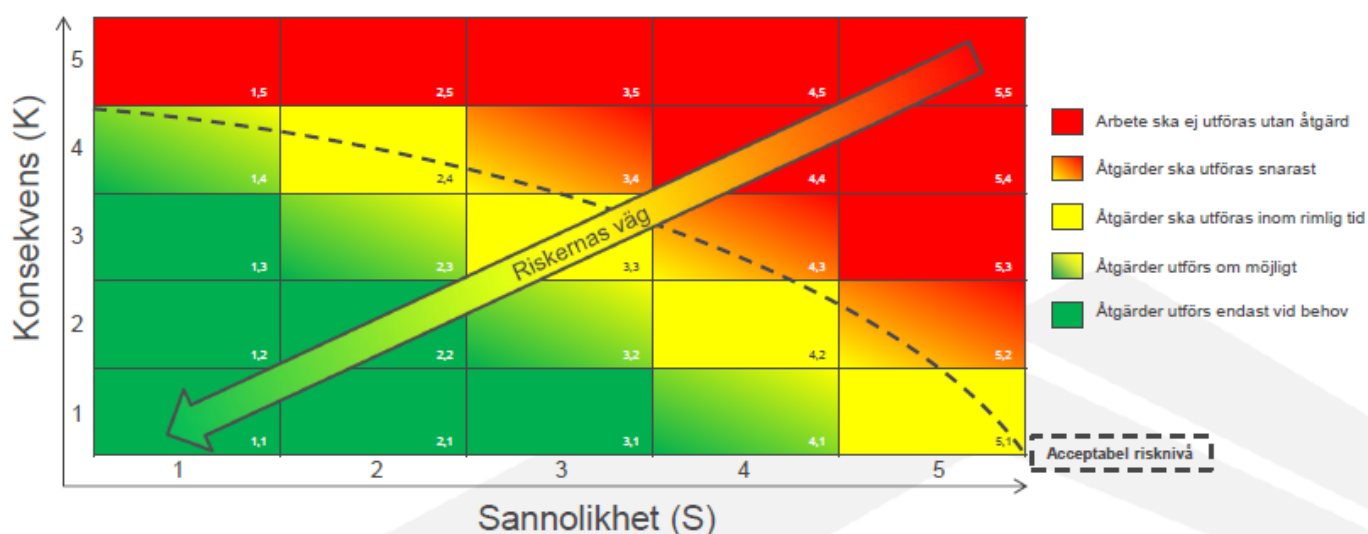
The values generated by the risk measurement are then used to carry out a risk evaluation using a risk matrix (see below). The assessment must be based on reasonable assumptions and the various boxes should not be seen as absolute limits. You must always "refine" your assessment yourself.

The assessments made in the risk estimation and risk evaluation are entered in the risk assessment document ([Appendix 3B](#)).

Interpretation guide:

Assessment of likelihood		Example	
5	Probable	It is very likely that the risk/event will occur	
4	Likely	It is likely that the risk/event will occur	
3	Possible	The risk/event may occur	
2	Unlikely	It is not very likely that the risk/event will occur	
1	Remote	It is not likely that the risk/event will occur, but it cannot be ruled out	
Assessment of impact		Example: work environment	Example: external environment
5	Extreme	Death, lifelong and serious lasting injury	Permanent damage, widespread. Remediation difficult or impossible
4	High	Hospital stay – severe fracture, head injury, damage to internal or external organs	Permanent damage, not very widespread. Remediation difficult or impossible
3	Medium	Treatment necessary, simple fractures, joint damage, severe sprain/strain, large wounds	Long-lasting damage. Limited spread. Simple remediation
2	Low	Some personal injury, smaller wounds, less severe sprains/strains, fissure	Temporary damage. Not very widespread. Little remediation
1	Negligible	Minor personal injury; grazes, bruises, lumps	No actual damage. Not very widespread. No remediation

RISKMATRIS



Risk reduction

For the risks identified, where necessary measures are to be planned to eliminate or reduce the risk. This is documented in the risk assessment (see Appendix 3B). The main thing that decides this is the severity of the risk evaluation. An acceptable level of risk can then be read off from the risk matrix. Risks that fall “below” this line do not require action to be taken, but there may be reasons for doing so anyway. For risks placed “above” the line, action is to be planned.

For each risk identified the action planned is noted, along with who is responsible for the action (see Appendix 3B). There is a hierarchy of risk reduction measures (see below), i.e. the primary action is to eliminate the risk, secondarily the risk may be “replaced” etc.

1. Eliminate the risk
Change a design to eliminate the hazard, e.g. introduce mechanical hoists to eliminate risks caused by manual handling.
2. Replace
Use a less hazardous material or reduce the system’s energy (e.g. reduce the power, flow, pressure, temperature etc.).
3. Technical control
Ventilation system, protection on machinery, regulation, sound damping.
4. Signs, warnings
Signs bearing safety warnings, demarcation of dangerous areas, illuminated or luminous signs, marking of walkways, warning sirens or warning lights, alarms, safety routines, tool inspections, access control, work safety systems, ID cards/other identification and work permits.
5. Personal protective equipment
Safety goggles, hearing protection, face masks, harnesses, respirators and gloves.

It may be that not all the risks can be remedied at the same time. Cost, investments and production factors may make it necessary to draw up a timetable for the measures.

Participants

Those carrying out the risk management must be trained in this. Risk analyses are to be performed by those who are directly involved (e.g. supervisor, operators and health and safety representatives), with additional expertise being brought in as required (e.g. corporate healthcare). To facilitate the process it is advantageous for it to be led by someone with experience of risk management. Operators and health and safety representatives must always participate in risk analyses where possible.

Updates of risk assessments

To check that the risk assessment is current and whether any new risks have been introduced, the risk assessment should be followed up once a year. Examples of new risks that may have arisen include those that have occurred in the form of accidents and near-misses. When the follow-up or update has been carried out this is noted on the document (see Appendix 3B).

Text for risk matrix diagram:

RISKMATRIS	=	RISK MATRIX
Konsekvens (K)	=	Impact (I)
Sannolikhet (S)	=	Likelihood (L)
Arbete ska ej utföras utan åtgärd	=	Work must not begin until action has been taken
Åtgärder ska utföras snarast	=	Action is to be taken as soon as possible
Åtgärder ska utföras inom rimlig tid	=	Action is to be taken within a reasonable time
Åtgärder utförs om möjligt	=	Action to be taken if possible
Åtgärder utförs endast vid behov	=	Action to be taken only if needed
Acceptabel risknivå	=	Acceptable risk level
Riskernas väg	=	Risk path

EXAMPLE