

M0-EN.4 Carrying out a Risk Assessment

In small workplaces is possible to carry out the risk assessment as a single, straightforward exercise, while in larger organizations it will be necessary to split the assessment up into manageable units. This division into units may be done based on:

- Processes or activities
- Departments or sections
- Services provided

If this approach is followed then aspects that are common to all units (e.g. electrical hazards, fire precautions) should be assessed for all the units together.

The information provided in the following sections aim to provide the trainees with some basic tools for assessing the risks at their work environment, to decide whether a hazard is significant or not, and whether there is a need for additional safety precautions. The “Five Steps Approach” presented here is a structured methodology on how employers, self-employed people, employees’ representatives can assess risks in their workplace. Although the presented principles are applied to all cases, the methodology is mostly aimed at small and medium enterprises.

M0-EN.4.1 The five steps approach

M0-EN.4.1.1 Step 1: Identification of the hazards

During this step it is necessary to identify what could reasonably be expected to cause harm. In order to do so it is necessary to do an “office assignment” and to spend time on site. Here are some basic steps:

During the office assignment collect information and documents such as:

- Previous risk assessments, if any
- The operating procedures, which should incorporate health and safety considerations, the risks involved and the precautions required
- The tasks performed (e.g. procedures, duration, location)
- The work equipment, materials and substances being used – Collect the manuals of the machinery / equipment being used - Collect the Safety Data Sheets for the chemical substances (they include the required safety precautions). If no documents are available ask the manufacturers and suppliers to provide you with the necessary information so that their products can be used in a safe manner
- The existing (if any) safety handbooks or lists of safety rules that are communicated to the employees
- The frequency and adequacy of the employees training in health and safety
- The legal and other requirements related to the workplace
- The accidents/incidents records and the records of the occupational diseases

During the on site visit:

- Walk through the workplace and look for potential sources of hazards. It is important to spend time in the work locations seeing how work is actually carried out (as opposed to how it should be carried out)
- Observe the work practices, but keep in mind that several times they might change once workers realize that they are under observation

- Interview the employees or their representatives, since they are familiar with the operations and may have identified things that are not directly obvious
- Check the work environment
- Observe external factors that may have an impact on the workplace (e.g. jobs performed by sub-contractors, weather conditions)
- Take samples or make measurements if possible

Although the occupational hazards are directly related to the sector of activity and not all of them exist in each workplace, the information in the table provided in section 2.1 could be used to form an initial/general checklist that will be modified according to the conditions of the specific workplace under consideration.

M0-EN.4.1.2 Step 2: Identification of the persons that might be harmed and how

During this step all those that may be at risk from the work activities, both employees and others, must be identified. The different categories of employees to be considered are: production workers, maintenance workers, administrative staff, security officers, cleaners, delivery drivers, sales representatives, sub-contractors, temporary employees, customers, and any third person.

Special consideration should be given to:

- Young workers and inexperienced staff
- Expectant or breastfeeding mothers
- Employees with disabilities
- Those working at night shifts and during weekends
- People working alone, at isolated working posts

M0-EN.4.1.3 Step 3: Evaluation of the Risks, and decision on whether existing precautions are adequate or more should be done

All identified hazards cannot be removed immediately. This is why the magnitude of the related risks should be evaluated before deciding on the measures to be taken for their management and before prioritizing the required actions.

The magnitude of a risk depends on a combination of two factors:

- *Probability (likelihood)*: The more often or more likely it is that a harmful event occurs, the greater the risk. When the likelihood of an event is evaluated the following questions should be asked:
 - o How often do situations occur where an accident is possible?
 - o What are the factors that contribute to the situation?
- *Consequences (severity of harm)*: The greater the loss when a harmful event occurs, the greater the risk. When the severity of a harm is evaluated the following questions should be asked:
 - o What could an accident typically lead to? What is the worse case that is reasonably foreseeable?

- o On how many employees, customers, third parties, machinery, equipment and products could the accident and its consequences have an impact?
- o Which are the indirect consequences of an accident?

There are different ways of assessing the risk once a hazard has been identified. One of the simplest methods is the ranking of likelihood and severity of harm by creating a matrix and giving the risk a score, according to the formula:

$$\text{Risk} = \text{Likelihood} \times \text{Severity of Consequences}$$

The matrix may have as many steps as desired, but most use three, five or seven steps (meaning 3, 5 or 7 ranks for each of the two factors). For the purpose of the present training module a 3-level matrix is adopted, where the rating of likelihood and severity of consequences is as follows:

Likelihood of Adverse Effects		
Rating	Category	Explanation
1	Unlikely	The harmful event is not expected to occur during the entire professional carrier of an employee (the event occurs every 100-1000 years)
2	Possible	The harmful event may occur at some point during the entire professional carrier of an employee (the event occurs every 10-100 years)
3	Frequent	The harmful event may occur repeatedly during the professional carrier of an employee (the event occurs every 1-10 years)

Severity of Consequences		
Rating	Category	Explanation
1	Minor harm	Accidents and illness related to the harmful event are not causing prolonged distress and only First Aids might be required (e.g. small scratches, eye irritations, temporal headaches, temporal pains, etc)
2	Moderate harm	Accidents and illness related to the harmful event are causing prolonged or periodically re-occurring distress, such as wounds, 2 nd degree burns on a limited body surface, allergies, limited injuries, and more than 1 day absence from work is required.
3	Severe harm	Accidents and illness related to the harmful event are causing serious or permanent distress, such as 2 nd degree burns on a large body surface, 3 rd degree burns, disabilities, injuries that lead to several days of absence from work, or death

Then, the risk assessment matrix looks like this:

Risk Assessment Matrix			
Likelihood of Adverse Effects	Severity of Consequences		
	Minor Harm (1)	Moderate Harm (2)	Severe Harm (3)
Unlikely (1)	Low (1)	Low (2)	Medium (3)
Possible (2)	Low (2)	Medium (4)	High (6)
Frequent (3)	Medium (3)	High (6)	Very High (9)

Where the risk rating is as follows:

Risk Rating		
Rating	Category	Explanation
1, 2	Low	There is no need for action, the risk is acceptable but it is necessary to ensure that it will remain at the same level
3, 4	Medium	Actions to reduce the level of risk are required and need to be planned. After the realization of the actions a re-evaluation of the risk is required
6, 9	High / Very High	The risk is unacceptable and actions to reduce it need to be taken at once. The work related activity should not restart before the implementation of the required preventive measures

For the case of “Medium Risk”, the need for *prioritization of actions* may arise. Then, the number of people affected need to be taken into account, and the following rate can be used:

Number of people affected	Rating
1	1
2 – 5	2
6 – 10	3
More than 10	4
More than 20	5

The higher the score of the multiplication *Rate of Risk x Rate of people affected* the higher the urge for immediate actions.

The main **advantages** of the risk rating with the use of the above type of matrices are the following:

- It takes into account both severity and likelihood
- It is straightforward, easy to apply and relatively objective
- It helps in determining priorities for improvements

While, some of the **disadvantages** are underlined below:

- Its application for each hazard associated with each individual activity can be time consuming
- Maybe more time is spent in deciding upon the assigned rates, rather than evaluating the effectiveness of controls
- Some quick and simple measures to improve the control of the so called “low risks” may be overlooked, since attention is focused on the higher-scored risks

There are several much more sophisticated approaches for assessing the risk, such as the HAZOP, the Failure mode and effect analysis, the Event tree analysis and the Fault tree analysis. However the implementation of these approaches requires specialized knowledge, can be used only by experts, and is beyond the scope of the present training course.

In case that a hazard cannot be eliminated it is important to take all those measures so that the associated **risk is as small as possible**. Consequently, the above evaluation method needs to take into account the preventive measures, which are already in place and their effectiveness. For example, electricity is a significant hazard since it can kill people (rate of severity of consequences = 3), but the likelihood of doing so in an office environment where (existing preventive measures) live components are insulated and metal castings are properly earthed is extremely small (rate of likelihood < 1). On the other hand, if there are worn cables or plugs, if an ‘octopus’ has been created by inserting several plugs into a multi-plug outlet connected to a single wall outlet, or in order to disconnect a cord the cord itself is pulled instead of the plug then the likelihood of an accident could be rated as high as 3 and the related risk is “Very High”.

The use of a **checklist** that includes all the necessary safety precautions that must be in place is a useful tool, especially for people that aim to assess the risks at their workplace but do not have a long experience on doing this. The more complete such a checklist is the more detailed the risk assessment is.

For each activity / process, there are both *generic and dynamic risks*. **Generic** are those risks that are related to the hazards that are normally associated with the specific activity / process in every workplace, and there are safety precautions that are normally applied (e.g. electrical safety, fire safety) in order to minimize them. These precautions could be found in general safety manuals or safety plans. The evaluation of the adequacy of the preventive measures that are in place for these cases is more or less a straightforward process, and a generic checklist can be proved a useful tool. On the other hand, there are always **dynamic** risks that rise from the particularities of

each workplace, the employees' mentality, the management's attitude towards OSH issues, etc. The evaluation of the effectiveness of the existing precautions in these cases is more difficult and requires an excellent knowledge of the workplace that is being assessed.

It is worth pointing out that although the evaluation of the effectiveness of the precautions is an integral part of the risk assessment process, this is overlooked in some organizations that concentrate on the identification of risks without checking whether the intended precautions are actually being taken in the workplace and whether these precautions are proving efficient. In order just to illustrate this principle, let's refer to one of the examples that was given in Section 2.1:

Hazard: Falling objects from the roof of a building.

During the risk assessment process the above hazard has been identified and in Step 3 the effectiveness of the precautions has to be evaluated in order to estimate the related risks. This process must take then into account issues such as:

- If barriers and/or warning signs at ground level are in place and being respected
- If the tool belts that are provided to the workers that are working at the roof of the building are actually being used by them
- If the workers at the ground level are wearing head protection, as they have been instructed

Apparently if safety precautions are in place but are not being respected their effectiveness is minimum and the related to the hazards risks are great (dynamic risks).

M0-EN.4.1.4 Step 4: Recording of findings and Preventive measures

All the findings of the risk assessment have to be recorded in a systematic, easy-to-follow and easy-to-review way. A standard format has to be created to be used for all the risk assessments in the specific workplace. This way the different findings are directly comparable and can be used for future reference. Such a format can also be used as a reminder to keep an eye on particular hazards and precautions. Such a standard format, called "Risk Assessment Tool" is being provided in Section 4.3 of the present training manual.

As soon as the identified hazards and the existing precautions have been recorded, and the effectiveness of these precautions has been evaluated and recorded, then the additional preventive measures have to be decided, taking into account the preventive priorities lay down by the Framework Directive 89/391/EEC and being mentioned in section 4.2. These additional preventive measures have to be recorded and an expected implementation deadline has to be decided. The identification of the need for specific additional safety precautions but the non-implementation of the need is of absolutely no use. Therefore, a person responsible for the realization of the new preventive measures has to be selected and a reasonable deadline has to be set. The evaluation of the effectiveness of the additional safety precautions is expected to take place during the reviewing process (Step 5).

All the recorded information is advised to be filed. In case that that more than 5 people are employed then the employer is responsible for keeping a full record of the identified hazards, the people that performed the risk assessment, the results of the process, the safety measures that was decided to be implemented and the people that are in risk. Such a record has to be demonstrated in cases of inspections from the related competent authorities.

M0-EN.4.1.5 Step 5: Reviewing and revising of the performed risk assessment

Risk assessment should not be a static process, a snapshot of a situation. It must lead to an action plan of preventive measures. Both, the assessment and the prevention plan then, must be reviewed regularly to make sure that the established precautions are still working effectively; otherwise the impact of the assessment on the quality of the working conditions is minimal. The reviewing of the performed risk assessment, in order to take into account the new hazards, is also required when:

- New machinery is being used
- New employees are being charged of specific activities
- New processes / activities are introduced in the workplace
- New substances are being used
- The working environment (e.g. space, ventilation, floors) has altered significantly
- The operating conditions (e.g. working shifts, duties) have changed significantly
- There is any other significant change

M0-EN.4.2 Prevention Priorities

The Framework Directive 89/391/EEC lay down the general principles of prevention that must be followed when deciding what to do with an identified hazard. The following steps are given in a prioritized order:

1. Avoid the risk
2. Evaluate the risk that cannot be avoided
3. Combat (control) the risks at source
4. Adapt the work to the individual, especially on issues related to the design of the workplace, the choice of work equipment and the working and production methods, aiming to eliminate monotonous work, and work at a predetermined work rate
5. Adapt to technical progress
6. Replace the dangerous by the non-dangerous, or the least dangerous
7. Develop a coherent, overall prevention policy which covers technology, organization of work, working conditions, social relationships and the influence of factors being related to the working environment
8. Give collective protective measures priority over personal protective measures. Personal protective equipment (PPE) should be considered as the last line of defense
9. Give appropriate instructions to employees
10. Consultation

As evident from the above list of priorities the main OSH rule is that **risks must be eliminated** whether it is technically possible to do so. Consequently, the aim of a risk assessment should not be to determine whether or not risks are acceptable, but to impose elimination where possible, and to assess only those risks that cannot be eliminated at a given point. Furthermore, existing regulations should be treated as the lowest standards that must be met, and must check that appropriate solutions have been found for all ascertained risks, even where the rules do not expressly provide for that particular solution.

M0-EN.4.3 A Risk Evaluation Tool

The following table provides a standard format that could be used for the recording of all findings of the risk assessment performed in a workplace. This tool could be used in combination with a detailed checklist in order to make sure that no significant hazard has been overlooked and all necessary safety precautions are being introduced.

The Risk Evaluation Tool has to be filled in by the person that will perform the risk assessment. In the general information part is necessary to record the date of the assessment and the sections or activities that have been assessed. The main part of the Tool is to be filled in during the assessment exercise. As soon as a hazard is identified, its source, the employees that might be affected by the specific hazard, the harm that might cause, and the safety measures currently implemented have to be mentioned in the form. This information provides the ground for the evaluation that will follow. Then, using the Risk Assessment Matrix provided in Section 4.1.3 the need or not for action will be identified. If there is a need for action, then the necessary actions have to be declared and a person responsible for ensuring that the declared actions have been implemented has to be appointed. As expected, the risk assessment process is a useful and an OSH preventive exercise only if the further safety measures that will be identified are to be implemented within a reasonable time interval according to their complexity and the related to the hazard risk. Therefore, a provisional date for the realization of the necessary actions has to be given and be considered binding.

As already mentioned, a detailed checklist provides a useful tool for the identification of the hazards. Therefore, each of the sectoral modules that are being developed here, includes either an overall checklist, or a checklist per activity in the considered sector and a “Hazard Table” with all the main hazards and the respective safety precautions is included for a direct use from the persons that wish to evaluate the risks at their workplace.

