EUROPEAN COMMISSION
DIRECTORATE-GENERAL V
EMPLOYMENT,
INDUSTRIAL RELATIONS
AND SOCIAL AFFAIRS

Guidance on risk assessment at work

Health and safety

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FOREWORD

The purpose of this guide, drawn up by the Public Health and Safety at Work Directorate in Luxembourg, is to help the Member States and management and labour fulfil the risk assessment duties laid down in framework Directive 89/391/EEC.

The Advisory Committee on Safety, Hygiene and Health Protection at Work, which played a major part in its preparation, considers the document to be a true reflection of the consensus reached by the parties involved.

Guidance on risk assessment at work is one of the measures covered by the Community programme concerning safety, hygiene and health at work (1996-2000) — COM(95) 282 final.

INTRODUCTION

This document is addressed to Member States to use or adapt as they choose in order to provide advice to employers, workers and other interested parties when they deal with the practical aspects of implementing the risk assessment requirements of Council Directive 89/391/EEC (notably Articles 6.3(a) and 9.1(a)) on the introduction of measures to encourage improvements in the safety and health of workers at work. The document describes how the strategies for the identification of hazards and control of risks should be based on the consultation and participation of all those who work at the workplace: employers, managers and workers and/or their representatives in accordance with national laws and practice. The document is not in a position to take account of the particular arrangements made in each Member State for the implementation of the 'framework' Directive 89/391/EEC. Therefore it will remain for those who read this document to decide how it can best be used with respect to their own national legislation.

Part A, Section 1 of the document gives guidance on how to carry out a risk assessment at work. It describes the steps to be taken leading to the identification of means of removing the risk or applying control measures where these are necessary. The document draws comparisons with everyday risks so that the part played by risk assessment at work can be seen in context. It is not necessary to consider the contents of these guidelines as the only method of performing risk assessment. There may be a variety of methodologies for achieving the same objective.

Section 2 of the first part, Part A of the document, follows by suggesting how employers should set about engaging external services to assist in risk assesment at work and how they might satisfy themselves that the services they are purchasing are reliable. However, in considering this matter, the point is made that external services should not be used as a substitute for the proper management of health and safety by the employer, with whom the legal responsibility rests.

The second part, Part B of the document, is particularly addressed to the needs of small and medium-sized enterprises where resources or expertise might be limited. It suggests how Member States can advise such businesses to tackle assessments at work for themselves, or how they might set about engaging somebody else to advise them.

Whilst the main concern of this document is with risk assessment, it does to a limited extent also consider aspects of risk management. This is regarded as inevitable because the demarcation between assessment and management of risk at work is, at a practising level, often unclear: the very act of assessing a risk often leads in practice to the development of ideas for control measures, and thereby into the realms of risk management. Equally, often those who are competent to assess risks are also competent to advise on control measures, but this may not always be the case.

PART A

RISK ASSESSMENT AT WORK — OVERALL APPROACH

Preliminary note:

Member States can use or adapt this guidance as they choose so as to be in conformity with the national legislative and administrative arrangements in their territories.

Section 1

Principles and general practice of risk assessment at work

Overview of risk assessment

1. Definitions

1.1. The words 'hazard' and 'risk' are not always given the same meaning in all the Member States of the Community, nor are they always given the same meaning in different scientific disciplines. For the purposes of this document meanings of these words which are accepted and considered practical in the context of the workplace have been used.

1.2. The definitions used are as follows:

(i) **Hazard:** The intrinsic property or ability of something (e.g. work materials, equipment, work methods and practices) with the potential to cause harm.

(ii) **Risk:** The likelihood that the potential for harm will be attained under the conditions of use and/or exposure, and the possible extent of the harm.

(iii) **Risk assessment:** The process of evaluating the risk to the health and safety of workers while at work arising from the circumstances of the occurrence of a hazard at the workplace.

2. Purpose of risk assessment

2.1. The employer at each workplace has a general duty to ensure the safety and health of workers in every aspect related to work. The purpose of carrying out a risk assessment is to enable the employer to effectively take the measures necessary for the safety and health protection of workers.

These measures include:

- prevention of occupational risks;
- provision of information to workers;
- provision of training to workers;
- organization and means to implement the necessary measures.

2.2. Whilst the purpose of risk assessment includes the prevention of occupational risks, and this should always be goal, it will not always be achievable in practice. Where elimination of risk cannot be realized, then the risks should be reduced and the residual risk controlled. At a later stage, as part of a review programme, such residual risks will be reassessed and the possibility of elimination of further reduction of the risk, perhaps in the light of new knowledge, can be reconsidered.

2.3. The risk assessment should be structured and applied so as to help employers or persons in control of the work to:

- identify the hazards created at work and evaluate the risks associated with these hazards so as to determine what measures they should take to protect the health and safety of their employees and other workers, having due regard to legislative requirements;
- evaluate the risks in order to make the best informed selection of work equipment, chemical substances or preparations used, the fitting out of the workplace, and the organization of work;
- check whether the measures in place are adequate;
- prioritize action if further measures are found to be necessary as a result of the assessment;
- demonstrate to themselves, the competent authorities, workers and their representatives that all factors pertinent to the work have been considered and that an informed valid judgment has been made about the risks and the measures necessary to safeguard health and safety;
- ensure that the preventive measures and the working and production methods considered to be necessary and implemented following a risk assessment, provide an improvement in the level of protection afforded to workers with regard to safety and health.

2.4. As suggested above, a risk assessment at work should be reviewed whenever a change which might alter the perception of risk is to be introduced at the workplace such as a new process, new equipment or materials, change of work organization, and new work situations including new workshops or other premises.

2.5. In any risk assessment and the subsequent elimination of risk or application of control measures it is essential that the risk is not transferred, that is to say that in providing a solution to one problem, another problem is not created. For example it would be of doubtful benefit to provide double-glazing to office windows in order to reduce noise from outside, unless provision were made for adequate ventilation.

Equally importantly, risk must not be transferred to another area; for example by providing exhaust ventilation of toxic substances in such a way that the discharge poses a risk to another workroom or to the public off-site (at one hospital the exhaust ventilation from a mortuary was discharged below the windows of a children's ward).

2.6. A flow chart outlining the risk assessment procedure and incorporating elements of risk management is set out in Table 1.

3. Key elements of risk assessment

3.1. A risk assessment is a systematic examination of all aspects of the work undertaken to consider what could cause injury or harm, whether the hazards could be eliminated, and if not what preventive or protective measures are, or should be, in place to control the risks. Please see Annex 1A for an illustrative list.

TABLE 1

FLOW CHART: RISK ASSESSMENT AND MANAGEMENT (para 2.6)

1. Establish programme of risk assessment at work

2. Structure assessment
   Decide on approach (geographical/functional/process/flow)

3. Collect information
   Environmental/tasks/population/past experience

4. Identify hazards

5. Identify those at risk

6. Identify patterns of exposure of those at risk

7. Evaluate risks
   Probability of harm/severity of harm in actual circumstances

   Measures not adequate — Measures present adequate

8. Investigate options for eliminating or controlling risk

9. Prioritize action and decide control measures

10. Implement controls

11. Record assessment

12. Measure effectiveness

13. Review (if changes introduced or periodic)

    Assessment still valid, No further action — Revision needed

14. Monitor programme of risk assessment
    No — Has there been a change ? — Yes

Note: The content and extent of each step depend on the conditions at the workplace (e.g. number of workers, accident history, ill-health record, work materials, work equipment, work activities, features of the workplace and specific risks).

3.2. The process of carrying out a risk assessment should be undertaken by management with the consultation and/or participation of all those involved at the workplace: the employers, management and workers and/or their representatives. They can all contribute to the different stages of the process.

3.3. A risk assessment involves the following steps:

- the identification of hazards;
- the identification of workers (or others) at potential risk from those hazards;
- an estimation of the risk involved; this might be qualitative or quantitative;
- considering if the risk can be eliminated; and if not
- making a judgment on whether further measures to prevent or reduce the risk need to be introduced.

These steps are considered in greater detail in Section 4 'Methodology'.

3.4. The risk assessment should cover the risks arising out of the work which are reasonably foreseeable. Risks arising from everyday activities associated with life in general and not normally thought of as being of concern (for example office staff being cut by paper) may not require the same detailed attention unless the work activity or organization compounds these risks.

3.5. Risk assessments have to be made for all workplaces. These can be broadly categorized as:

- fixed establishments, e.g. offices, schools, factories;
- workplaces subject to change, e.g. building site, docks, ship-building;
- mobile workplaces, e.g. temporary workplaces for maintenance of public services, visiting duties;

However, at each type of location the work might:

- either follow an established pattern, such as in a workshop with a production line;
- or might be changing and developing, as for example at a building site.

and, of course, there will be variations between these extreme cases. Therefore the risk assessment should be designed to cater for the different work patterns.

3.6. For the relatively unchanging sort of workplace such as an office, an engineering workshop or clothing manufacturers the risk assessment can be such that it:

- takes account of the usual conditions;
- need not be repeated where work stations are comparable;

- but identifies the need for a revised, or different, assessment when circumstances change, e.g. when new machinery, methods or materials are introduced, or for maintenance work.

3.7. At workplaces where circumstances and conditions are changing the assessment requires an approach which takes account of these changes. Risks can be assessed generically so that the principles for elimination and control are applied even though the workplace changes. Thus, for example, the principles of good scaffolding can be applied to each building site, farmers should take account of the different seasons and the bearing these may have on outdoor working, or window cleaners should consider procedures to establish safe means of access.

3.8. Risk assessments should be made, not just by the employer or the employer's representative working in isolation, but also by involving the employees or their representatives. They should be consulted as part of the assessments and given information concerning the conclusions of the assessments made and the preventive measures to be taken.

3.9. Another important element which must always be considered is the possible presence at the workplace of employees of other businesses, or other persons. Their presence should be considered not only as persons at risk, but also because their activity might introduce risks to employees already working permanently at the premises. For example, subcontractors might bring their own transport on to site — whose presence might not be expected, they might need to use sources of ignition such as welding equipment or might be handling and storing heavy equipment or moving other materials adjacent to gangways and walkways, all of which would create potential risks to the employees normally working there, and for whom such activities might be unfamiliar.

3.10. Equally, employers of workers who work at the premises of other enterprises, e.g. as maintenance contractors from staffing agencies, will have to ensure the health and safety of their employees whilst they are at work. These employers will also need to carry out risk assessments including taking account of the interaction between their employees and the activities they perform, and those of the enterprise at which they are working. They should inform the occupier of the premises and other employers or their workers who may be affected, of any risks which are created and the necessary preventive measures.

3.11. Visitors, such as students, members of the public, patients at hospitals, to premises must always be specially considered because they are unlikely to be familiar with the risks that are present or the precautions to be taken. That is why many enterprises have sets of rules for visitors and may provide each visitor with a summary copy of these.

4. Methodology

4.1. There are no fixed rules about how the risk assessment should be undertaken. However there are two principles which should always be borne in mind when approaching a risk assessment:

- to structure the assessment to ensure that all relevant hazards and risks are addressed (e.g. not to overlook tasks, such as cleaning, that might take place

out of 'normal' working hours, or ancillary departments such as waste compacting);

- when a risk is identified, to begin assessment from first principles by questioning if the risk can be eliminated: is the causal hazard necessary (for example, could an internal road traffic problem be avoided by insisting that traffic only used an existing roadway within the enterprise, but at the boundary)?

4.2. A number of approaches (and combinations thereof) to risk assessment can be adopted provided they encompass the key elements set out above in paragraph 3. The approaches to risk assessment at work which are used are normally based upon:

- observation of the workplace environment (e.g. means of access, conditions of floors, machinery safety, dust and fumes, temperature, lighting, noise, etc.);
- identification of tasks carried out at the workplace (to identify all tasks so that all are included in risk assessment);
- consideration of tasks carried out at the workplace (evaluation of risks from the different tasks);
- observation of work in progress (check that procedures are as laid down or predicted, and that there are no other risks arising);
- consideration of patterns of work (to assess exposure to hazards);
- consideration of external factors that could affect the workplace (e.g. weather consideration for outdoor workers);
- review of psychological, social and physical factors which might contribute to stress at work, how they interact together and with other factors in the work organization and environment;
- consideration of organization to maintain conditions, including safeguards (e.g. that systems are in place to assess risks from new plant, materials, etc., to update information on risks).

The observations made can then be matched against criteria to ensure health and safety based on:

(i) legal requirements;

(ii) published standards and guidance, e.g. national technical guidelines, codes of practice, occupational exposure levels, trades association standards, manufacturers' guidance, etc.;

(iii) principles of the hierarchy of prevention of risks;

- avoiding risks;
- substituting the dangerous by the non-dangerous or the less dangerous;
- combating risks at source;

- applying collective protective measures rather than individual protective measures (e.g. control exposure to fume by local exhaust ventilation rather than personal respirators);
- adapting to technical progress and changes in information;
- seeking to ensure an improvement in the level of protection.

These criteria are shown separately in Table 2.

For some complex problems of risk, or particular problems of low risk/high consequence, a mathematical approach to risk assessment might be adopted as an aid to decision-making. This is a specialized activity that is not considered further in this document. In the great majority of workplaces the mathematical expression of what might be acceptable risk is replaced by working to models of current good practice such as are suggested above.

TABLE 2

CRITERIA TO APPLY FOR RISK ASSESSMENT

Legal requirements

Published standards and guidance, e.g. national technical guidelines, codes of practice, occupational exposure levels, trades association standards, manufacturers' guidance, etc.

- principles of the hierarchy of prevention of risks;
- avoiding risks;
- substituting the dangerous by the non-dangerous or the less dangerous;
- combating risks at source;
- applying collective protective measures rather than individual protective measures (e.g. control exposure to fume by local exhaust ventilation rather than personal respirators);
- adapting to technical progress and changes in information;
- seeking to ensure an improvement in the level of protection.

4.3. Which approach to assessment is applied will depend upon:

- the nature of the workplace (e.g. fixed establishment, transitory);
- the type of process (e.g. repeated operations, developing/changing process, work on demand);

- the task performed (e.g. repetitive, occasional such as batch processing, seasonal pesticide application, high risk — such as work on electrical switch gear, entry into confined spaces);

- technical complexity.

In some cases a single exercise covering all risks in a workplace or activity may be appropriate. In other cases different approaches might be appropriate to different parts of a workplace.

Thus, for example, in a large engineering workshop with a standard product range it might be appropriate to conduct an assessment by separately considering:

- the machinery, and mechanical dangers, including those arising from computer control technology;

- materials processed or used on the machines, e.g. special alloys, cooling fluids etc., and possible risks to health;

- general environment (e.g. temperature, ventilation, humidity, noise, lighting);

- means of access;

- use of auxiliary equipment, such as lifting machinery, works transport;

- special processes, e.g. metal hardening;

- electrical safety;

- other activities such as cleaning, maintenance;

- psychological, social and physical factors contributing to stress at work.

Some other activities relevant to the workshop might be assessed separately by considering the tasks applied to the premises as a whole, e.g. cleaning of windows or lighting fittings, selection of new machinery, training of new employees.

However, if these activities are assessed separately, it will none the less be essential to consider whether there might be any interaction between them which could affect the assessment of risk.

Most of the assessment to be made in the above example would probably be based on observations of the work activity. However some aspects, such as use of computer control technology, or special cleaning and maintenance procedures would require a more considerative approach based on the procedures established and implemented.

4.4. In practice it is often helpful to think of risk assessment as a process carried out in a series of steps in which each subsequent step is a move to focus, or consider in greater depth, a particular topic where risk is identified. Broadly these steps can be described as:

- Overall assessment which separates risks into those which are well known and for which control measures are readily identified and can be seen to be in place, and those risks requiring a more detailed consideration;

- Assessment of those risks for which a more detailed consideration is needed. This step may lead to yet further steps if more sophisticated means of risk assessment have to be applied to complex risk situations.

These steps to progress an assessment are described further in paragraphs 4.8 onwards.

It is essential that, for whichever approach is adopted, there should be consultation and/or participation of those who work at the workplace. This is to ensure that hazards are identified:

- not only from principles of knowledge of hazards, e.g. properties of chemical substances, dangerous parts of machinery;

- but also by knowledge of working conditions and patterns of adverse effects upon workers which might not have been foreseen, for example, where a group of workers, or a single worker, might develop sub-acute symptoms of adverse health these will require enquiry to try to identify the hazard and then assess the risk.

4.5. When a risk assessment at work is to be done, often the quickest and surest way to identify the details of what really happens, is to ask the workers involved in the work activity being assessed. They will know what process steps they follow, whether there are any short cuts, or ways of getting over a difficult task, and what precautionary actions they take. Employers should therefore make sure that whoever is making the risk assessment, whether an employee or an external consultant, speaks to the workers, or others such as contractors who actually carry out the work.

4.6. Workers can also draw attention to some hazards which, by their nature, are difficult to identify. These are the sort of problems which might arise out of the organization of the work, work pattern or work station, that people sometimes take for granted or put up with at the cost of their own comfort. Workers might consider that the way in which work is presented to them leads to difficulties: for example because it is presented too quickly resulting in stress, or perhaps because it is presented in such a way that the worker has to stretch or adopt an awkward stance which can lead to niggling or acute aches and pains, and repetitive strain injury.

4.7. An overall assessment should:

- where possible, identify risks which can be eliminated. In many cases this may not be achievable, but it should always be considered;

- complete consideration of those hazards for which no further action need be taken (for example staircases, hand tools, which are properly designed and subject to normal usage). However, it is necessary to be alert to possible exceptional or special use. For example, if exceptionally heavy loads were to be carried up or down a staircase, or the hand tools were used for stone dressing, a more detailed risk assessment would be appropriate;

- identify those risks which are well-known and for which control measures are readily identifiable and available; and

- show where a fuller assessment is needed, and if appropriate, using more sophisticated techniques.

4.8. Where further action is needed to complete a risk assessment it should entail at least the following steps:

1. Identification of the hazards in all aspects of work.

2. The identification of all those who might be exposed to the hazards, including groups of persons who might be particularly at risk (see Annex 2A for examples).

3. An estimate of the risk, taking account of the reliability and adequacy of existing preventive or precautionary measures.

4. A decision on what new measures (if any) need to be introduced if the risks can be eliminated or reduced, taking what is regarded as good practice as a guideline.

5. Prioritization of the precautionary measures to be adopted.

The above steps are now considered in more detail.

1. Identification of the hazards in all aspects of work

This should be approached by:

(a) consultation and participation of workers and/or their representatives to provide their perception of hazards and adverse effects;

(b) by examining systematically all aspects of the work, that is:

- looking at what actually happens in the workplace or during the work activity (actual practice may differ from the works manual). Work situations that should be considered include new installations, commissioning and decommissioning, normal activities, maintenance and cleaning, and foreseeable emergencies;

- thinking about non-routine and intermittent operations (e.g. maintenance operations, loading and unloading, sampling, changes in production cycles);

- taking account of unplanned but foreseeable events such as interruptions to the work activity.

(c) identifying those aspects of the work with the potential to cause harm (the hazards), focusing on those liable to arise because of the work activity; (a list of primary hazards frequently found at work is shown in Annex 1 A); and

(d) by applying the concept of hazard very widely to take account not only of the various hazards mentioned in the check-list but also how workers interact with them during their work and thereby affect the level of risk.

2. The identification of all those who might be exposed to the hazards, including groups of persons who might be particularly at risk (see Annex 2A)

To do this:

- account should be taken of workers interacting with the hazards whether directly or indirectly, e.g. a worker painting a surface is directly exposed to solvents, while other workers in the vicinity, engaged in other activities, are inadvertently and indirectly exposed;

- particular attention should be paid to groups of workers who might be at increased risk (Annex 2A).

3. An estimate of the risk, taking account of the reliability and adequacy of existing preventive or precautionary measures

This can:

- be, at one extreme, a very straightforward process based on judgment and requiring no specialist skills or complicated techniques. This will be generally the case for workplaces presenting hazards of low concern, or where the risks are well known, readily identified, and means of control readily available;

- provide, at the other extreme, the basis for a complete health and safety case or report incorporating such techniques as quantitative risk assessment, e.g. for complex processes such as a large chemical plant;

- fall in between the above two extremes. This can be expected to be the case where it is not possible to identify the hazards and evaluate risks without professional knowledge, support and advice. This might arise in respect of the more complex processes and technologies in the workplace or hazards, such as those related to health, which may not be readily or easily identifiable, and may require analysis and measurements.

It will be he pful to consider the possible extent of harm from an identified risk as a range of outcomes such as:

- minor damage;

- non-injury incident;

- minor injury (bruise, laceration);

- serious injury (fracture, amputation, chronic ill-health);

- fatal;

- multiple-fatality;

and the likelihood of the possible harm occurring as also acting through a range such as:

- improbable;

- possible (but not very likely);
- probable;
- inevitable (over time).

4. A decision on what new measures (if any) need to be introduced if the risks can be reduced, taking what is regarded as good practice as a guideline

The objective of this step is to provide the protection for the worker which is required by Community and national legislation. Table 3 summarizes the sorts of conclusions which could be expected and the actions that might follow. It makes the point that wherever preventive measures are to be taken they should improve the level of protection afforded to workers with regard to safety and health.

Where possible, it is particularly important that decisions of this type should be made at the design or purchasing stages of new processes, plants, products and procedures.

Of course it will remain essential that inspection or audit or other management systems ensure that the precautions are properly applied and maintained; but that is a matter of risk management and beyond the scope of this guidance.

5. Prioritization of the precautionary measures to be adopted

It is essential that the work to be done to eliminate or prevent risks is prioritized. The prioritization should take account of the severity of the risk, the likely outcome of an incident, the numbers who might be affected and the time necessary for taking preventive measures.

Some problems cannot be resolved immediately. It may well be that a prioritization programme will have to incorporate steps which can be taken in the short-term as part of a progressive programme to eliminate or reduce risks in the longer term.

5. Actions as a result of risk assessment at work

5.1. The conclusions of a risk assessment at work should identify:

- if the risk is adequately controlled;
- if not, options for reduction of risk;
- priority;
- whether steps could be taken to improve the level of protection afforded to workers with regard to safety and health;
- others who might be affected.

These are considered further in the following paragraphs.

TABLE 3

ACTION RESULTING FROM POSSIBLE CONCLUSIONS ABOUT RISKS

CONCLUSIONS	ACTION
Risks insignificant now and not reasonably foreseeable that they could increase in future	Finish assessment now. No further measures necessary
Risks are controlled to acceptable standard, e.g. conform to Community or national standard	Make improvements to protection if possible. Finish assessment. Maintenance of standards is a matter for employer's preventive systems
Risks are controlled now but could reasonably become higher in the future or existing control systems prone to failure or misuse	Determine precautions to make improvements to protection, maintain, eliminate, control and minimize chances of higher exposure occurring. Determine additional measures for regaining control in case high risk event does occur, despite precautions
Possible risks but no proof that they will lead to illness or injury	Compare existing measures with standards of good practice. If comparison unfavourable, determine what has to be done about improving preventive and protective measures
Risks are adequately controlled but do not accord with the general principles laid down in Article 6.2 of Directive 89/391/EEC	Eliminate risk or modify regime for controlling risk so as to conform with principles laid down, taking good practice as a guide
Risks which are high and not adequately controlled at present	Identify and implement immediate interim measures for preventing or controlling exposure to risk (consider stopping the process). Assess long-term requirements
No evidence either way whether risk exists	Keep looking for more information as necessary until it is possible to arrive at one of the conclusions above. Meanwhile apply principles of good occupational health and safety to minimize exposure

Adequate control

5.2. Whether or not the identified risks are adequately controlled will be assessed against the criteria outlined in Paragraph 4.2. and Table 2. It may be that on occasions published standards and guidance are not available as yardsticks against which an assessment can be made. Then the assessment has to be based on the application of basic principles to reduce risks to health and safety in order to improve the protection afforded to workers.

Options for reduction of risk

5.3. The first option to be considered should always be that of removing the hazard. For example windows on tall buildings might be designed so that they can be cleaned from inside, rather than relying on potentially difficult external access. However, whilst this option of elimination should always be considered, in many situations it will not be practical because the hazard and consequent risk are an integral part of the work process or activity.

5.4. Sometimes it might be possible to replace the machine or material or other feature that introduces the hazard by an alternative. For example it might be possible to replace chlorinated cleaning solvents by a non-toxic method, or a less toxic material. However, whenever substitution is considered it is essential to first of all assess the implications. On the basis of the effects of substitution a decision can be made as to whether this is a suitable course of action.

5.5. Where other options, such as different guarding systems for machinery, or protective clothing for outdoor workers, are identified the relative merits of the different options should be assessed. The different measures to be taken, and if necessary, the protective equipment to be used should be decided. Workers should be encouraged to contribute to this process in order to bring to bear their experience of the effectiveness of the control measures available. They might, for example, be able to point out where a guard is difficult to use in practice, and how its design could be improved; or why it is that fixed local exhaust ventilation is not adequate to control fumes for some of the tasks they do. Similarly, it is particularly important that workers participate in the selection and use of personal protective equipment (p.p.e.). The employer will have to make sure that when p.p.e. is used it is adequate for the job: that the p.p.e. has the performance characteristics necessary to provide the protection for which it is intended, and that appropriate training in correct maintenance and use is given. For example, are safety goggles of sufficient strength to withstand the impact of flying particles, or is a filter in a respirator the correct one for the particular dust or fume to which a worker might be exposed? For their part the workers should contribute on such matters as whether the p.p.e. is a suitable fit, does it interfere with the work and perhaps introduce other risks, and whether it becomes difficult to work with after a time.

Priority

5.6. The need for careful consideration of priorities for action has already been mentioned at Paragraph 4.9.5. The selection and implementation of priorities will be closely associated with other aspects of risk management.

Improvement of protection afforded to workers

5.7. Even where the control of risks conforms to published guidance it may be possible, and employers might choose, to improve the protection afforded to workers with regard to safety and health, for example where exposure to noise at work might be to levels below an established limit value, but could be further reduced by the application of well-known engineering techniques.

Other workers

5.8. Sometimes the conclusion of an assessment will concern employees of outside undertakings who will potentially be affected by activities at the workplace when they visit to carry out their work. The employer should arrange that the employer of the outside undertaking and their workers are informed of particular risks, protective measures to be taken, and protective equipment to be used.

6. Organization for risk assessment

Responsibilities of employers

6.1. Employers should carefully prepare what they are going to do in order to meet their responsibilities to make a risk assessment and take the measures necessary for the safety and health protection of workers. It is recommended that they do this through the development, implementation and monitoring of an action plan for the elimination or control of the risks.

6.2. The action plan should include:

- commissioning, organizing and coordinating the assessment;
- appointing competent people to make the assessments;
- consulting workers' representatives on arrangements for the appointment of those who will make the assessments;
- providing the necessary information, training, resources and support to assessors who are the employer's own employees;
- ensuring adequate coordination between assessors (where relevant);
- involving management and encouraging the participation of the workforce;
- determining the arrangements to be made for reviewing and revising the risk assessment;
- ensuring that the preventive and protective measures take account of the results of the assessment;
- monitoring the protective and preventive measures to ensure that their effectiveness is maintained;
- informing workers and/or their representatives of the results of the assessment and of the measures introduced.

7. Selection of persons to make assessments

7.1. In any organization, the final decision as to who shall carry out risk assessments, is a decision for the employer. The persons who make risk assessments can be:

- the employers themselves;
- employees, designated by the employers;
- external services.

Competence of persons who make risk assessments

7.2. Whoever is to make a risk assessment at work, what is essential is that they should be competent for their task.

7.3. It may be that a person designated to make risk assessments is not competent for the whole range of risk assessment tasks which it is necessary to evaluate. For example a qualified electrical engineer might not have the necessary training and knowledge to assess the risks arising from a complex chemical process. It is essential that those making the assessment and employers recognize the limits of their assessment skills so that wherever necessary the need for additional or specialist expertise is identified and brought in to the risk assessment process.

7.4. In practice it will often be necessary for risk assessments to be made by a team bringing together different competences.

7.5. Persons making risk assessments can demonstrate their competence by showing that they have the following abilities:

1. Understand the general approach to risk assessment.
2. Have the capacity to apply this to the workplace to be assessed and to the task required. This may require:
   - identifying the health and safety problems (see also Paragraph 8.1);
   - assessing and prioritizing the need for action;
   - suggesting options available to eliminate or reduce risk and their relative merits;
   - evaluating their effectiveness;
   - promoting and communicating health and safety advances and practice.
3. Are able to identify situations where they would be unable to adequately assess the risk without assistance and be able to advise on the need for further assistance.

7.6. Where quantified risk assessment techniques are required, then the persons making the assessments should be conversant with the application of sophisticated logical analysis, simulation and quantification techniques (particularly for low frequency/high consequence incidents).

Relationship between those making the risk assessment and prevention services

7.7. The product of the 'risk assessors' work is the identification of risks for which steps should be taken to eliminate or reduce the risk, and suggestions as to means of prevention and the priority for this work. However, sometimes the prevention of risks arising at work is seen as a separate function, for example such as the work done by some safety officers or safety engineers whose variety of tasks includes inspection and auditing of workplaces (see also Paragraph 11).

7.8. The arrangements made by an employer for completing the risk assessment and prevention, control and monitoring tasks are a matter for the employer to decide. In some smaller enterprises it will be appropriate that this is the work of one person. In other larger, more complex enterprises, the various tasks may well be shared by a number of people bringing together different expertise and knowledge.

8. Information needs

8.1. Persons making risk assessments at work should have knowledge of and/or information on:

- hazards and risks which are already known to exist and the way they arise;
- the material, equipment and technology used at work;
- working procedures and organization and interaction of workers with materials used;
- the type, likelihood, frequency, and duration of exposure to the hazards. In some cases this may mean the application of modern, validated techniques of measurement;
- the relat on between exposure to a hazard and its effect;
- the legal standards and requirements relevant to the risks present in the workplace;
- what is regarded as good practice for areas where there are no specific legal standards.

8.2. Where employees of different employers work in the same workplace, assessors may need to share information about risks and the health and safety measures in place to address those risks. Facilitating this will be a matter for the employer to arrange.

9. Sources of information

Information may be gathered from:

- analysis of work activity to predict possible incidents (particularly where quantified risk assessment is used);
- consultation and/or participation of the workers and/or their representatives;
- manufacturers' and suppliers' data sheets or manuals;
- repositories of knowledge and experience for the activity, e.g. trade associations or qualified health and safety professionals;
- health and safety journals and databases;
- guidance available from national competent bodies or institutes in the field of health, safety and hygiene at work;
- accident and incident data (including records of hazardous events, e.g. near misses), epidemiological studies;
- written site practices, manuals and operating procedures;
- monitoring data and records of measurements;
- anonymized data from health surveillance;
- relevant scientific and technical literature;
- standards established by European or national standardization bodies;
- minimum safety and health requirements for workplaces as set out in Annex I (workplaces used for the first time) and Annex II (workplaces already in use) of Directive 89/654/EEC concerning the minimum safety and health requirements for the workplace.

10. Recording

10.1. A record of the results of risk assessments at work should be kept. The aim of the record is that it should be a useful tool. It could serve as a point of reference to indicate that all risks have been assessed and the criteria used in the assessment; and that those findings not recorded are judged not to be matters of concern. However, it will be necessary to be able to defend this judgment. The record should show:

- that a programme of risk assessments at work has been implemented and effectively carried out;
- how the programme was carried out;

- special or unusual risks (e.g. infectious risks at work);
- groups of workers facing particular risks (e.g. local authority workers who enter drains or sewers, electrical maintenance workers, crane drivers, etc.);
- other risks of concern;
- as appropriate, the decisions made in the assessment of risk, including the information on which those decisions were based where published standards or guidance are not available;
- published standards or guidance otherwise applied (e.g. machine guarding standards);
- recommendations for measures to further reduce risk or otherwise improve protection;
- arrangements for review of assessments.

10.2. The records of assessments should be drawn up with the consultation and participation of the workers and/or their representatives and made available to them for information. The workers concerned should, in any case, be informed of the outcome of each assessment that relates to their work station and the action to be taken as a result of the assessment.

10.3. The records of risk assessments should also be available to:

- workers designated by the employer to have special functions in protecting safety and health;
- workers representatives with specific responsibilities for safety and health.

11. Monitoring the effectiveness of measures

11.1. Arrangements for planning, organizing, monitoring and reviewing the protective and preventive measures should be introduced following the risk assessment to ensure that the effectiveness of these measures is maintained, and the risks controlled.

11.2. The information generated by monitoring activities should be used to inform the review and revision of the risk assessment.

12. Review and revision

12.1. Risk assessment should not be a once-and-for-all activity. The assessment needs to be reviewed and revised, as necessary, for a number of reasons, including:

1. The assessment might result in changes to the work process, such as the substitution of a chemical agent by one which is less flammable, or use of different machine tools. The implementation of these changes should have been assessed before ever the changes were made. Nonetheless, once the

changes have been introduced the new working conditions should be assessed in order to review the consequence of the change in practice.

2. Precautionary measures introduced to reduce risk may affect the work process. For example the introduction of a permit-to-work system for carrying out 'hot work' will necessitate removing flammable materials, or changed access routes to improve work transport safety may have implications for location of stored materials.

3. The assessment:

   - may no longer be applicable because the data or information on which it is based are no longer valid;
   - can be improved;
   - needs to be updated and revised.

4. The preventive and protective measures currently in place are insufficient or no longer adequate, e.g. because new information is available regarding particular control measures.

5. As a result of the findings of an investigation of an accident or 'near-miss'. Investigation of accidents resulting in injury or ill-health may reveal the need for change in order to prevent similar accidents. The investigation of near-misses can also yield important information about risk and help to identify measures that may be needed to reduce risk.

12.2. 'Near misses', including incidents and near accidents, are events from which much fruitful information about risk situations can be obtained. Workers might be able to provide information on 'near misses': when something goes wrong but does not result in injury to people or damage to goods. Other terms such as 'non-injury incident', 'hazardous event' are sometimes used to express this idea, and definitions vary according to the aims to be achieved: most commonly a 'near miss' is defined as a non-injury accident. Often after an accident, or damage to products, people can recount how it nearly happened before, on other occasions. It is much better to identify the 'near misses' and take the steps to prevent the accident ever happening. In order to adopt this approach employers may need to give special attention to creating the right climate of opinion within the workplace which will encourage workers to report such near misses. Employees' health and safety representatives have a useful role to play in this approach by providing a channel for information on near misses and contributing to the investigation of causes and identification of preventive measures.

12.3. In most cases it will be prudent to review risk assessments at regular intervals, depending on the nature of the risks and the degree of change likely in the work activity. This is without prejudice to any requirements in Council Directives for regular review of assessments.

ANNEX 1A

Illustrative examples of work situations and activities requiring risk assessment (Para 4.3.)

(Note this is an illustrative list and does not indicate priorities; that is a matter for the risk assessment at the workplace.)

1. Use of work equipment

1.1. Inadequately guarded rotating or moving parts which can crush, clip, stab, knock, catch or pull.

1.2. Free movement of parts or material (falling, rolling, sliding, tipping, flying off, swinging, collapsing) which may result in a person being hit.

1.3. Machine and vehicle movements.

1.4. Danger of fire and explosion (e.g. from friction, pressure vessels).

1.5. Trapping.

2. Work practices and layout of premises

2.1. Hazardous surfaces (sharp edges, corners, points, rough surfaces, protruding parts).

2.2. Working at heights.

2.3. Tasks involving awkward movements/postures.

2.4. Limited space (e.g. having to work between fixed parts).

2.5. Tripping and slipping (wet or other slippery surfaces etc.).

2.6. Stability of workstation.

2.7. Impact of wearing personal protective equipment on other aspects of work.

2.8. Work techniques and methods.

2.9. Entry and work in confined spaces.

3. Use of electricity

3.1. Electrical switchgear.

3.2. Electrical installations, e.g. ring mains, lighting circuits.

3.3. Electrically-operated equipment, controls, insulation.

3.4. Use of portable electric tools.

3.5. Fire or explosion initiated by electrical energy.

3.6. Overhead electric lines.

4. Exposure to substances or preparations hazardous to health and safety

4.1. Inhalation, ingestion and skin absorption of a material hazardous to health (including aerosols and particulates).

4.2. Use of flammable and explosive materials.

4.3. Lack of oxygen (asphyxia).

4.4. Presence of corrosive substances.

4.5. Reactive/unstable substances.

4.6. Presence of sensitizers.

5. Exposure to physical agents

5.1. Exposure to electromagnetic radiation (heat, light, x-ray, ionizing radiation).

5.2. Exposure to lasers.

5.3. Exposure to noise, ultrasounds.

5.4. Exposure to mechanical vibrations.

5.5. Exposure to hot substances/media.

5.6. Exposure to cold substances/media.

5.7. Presence of fluids under pressure (compressed air, steam, liquids).

6. Exposure to biological agents

6.1. Risk of infection arising from handling and resulting in unintentional exposure to micro-organisms, exo- and endo-toxins.

6.2. Risk of infection due to inadvertent exposure to micro-organisms (e.g. legionella dispersed from wet cooling towers).

6.3. Presence of allergens.

7. Environmental factors and working climate

7.1. Inadequate or inappropriate illumination.

7.2. Inappropriate control of temperature/humidity/ventilation.

7.3. Presence of pollutants.

8. Interaction of workplace and human factors

8.1. Dependence of safety system on need to receive and process information accurately.

8.2. Dependence on knowledge and capabilities of staff.

8.3. Dependence on norms of behaviour.

8.4. Dependence on good communication and proper instructions to tackle changing conditions.

8.5. Impact of reasonably foreseeable departures from safe working procedures.

8.6. Suitability of personal protective equipment.

8.7. Poor motivation to work safely.

8.8. Ergonomic factors, such as design of the work station to suit the worker.

9. Psychological factors

9.1. Severity of work (intensity, monotony).

9.2. Workplace dimensions, e.g. claustrophobia, working alone.

9.3. Role ambiguity and/or conflict.

9.4. Contribution to decision-making affecting work and task.

9.5. High demand, low control of work

9.6. Reactions in event of emergencies

10. Work organization

10.1. Factors conditioned by work processes (e.g. continuity, shift systems, working at night).

10.2. Effective management systems and arrangements in place for organizing, planning, monitoring and controlling the health and safety process.

10.3. Maintenance of equipment including safety equipment.

10.4. Proper arrangements for dealing with accidents and emergencies.

11. Miscellaneous factors

11.1. Dangers caused by other people, e.g. violence to counter staff, staff-security guards, police; and sports.

11.2. Working with animals.

11.3. Working in pressurized or under-pressurized atmospheres.

11.4. Severe weather conditions.

11.5. Software integrity.

11.6. Working near or under water.

11.7. Variable workplaces.

ANNEX 2A

Workers and others who may be at risk (Para 4.8.2.)

- Employees engaged in production, manufacturing, distribution, retailing and R&D activities, etc.;
- ancillary or support-services employees (cleaners, maintenance staff, temporary workers, etc.);
- contractors;
- self-employed workers;
- students, apprentices and trainees;
- office and shop workers;
- visitors;
- emergency services;
- laboratory workers.

Workers who may be at increased risk

- staff with disabilities;
- young and old workers;
- pregnant women and nursing mothers;
- untrained or inexperienced staff (e.g. new recruits, seasonal and temporary workers);
- people working in confined or poorly ventilated spaces;
- maintenance workers;
- immuno-compromised workers;
- workers with pre-existing ill-health; e.g. bronchitis;
- workers receiving medications which might increase their vulnerability to harm.

Section 2

Selection, involvement and use of external services as consultant health and safety specialists to make risk assessments

1. Introduction

1.1. This section gives guidance on the use of external services to provide health and safety specialists for risk assessment at work, how they may be selected and what they may be expected to contribute.

1.2. Directive 89/391/EEC places the responsibility for ensuring occupational health and safety on employers. It goes on to provide for employers to designate workers or to enlist competent external services or persons to carry out activities related to the prevention of and protection from occupational risks. Where the employer makes use of external services for this purpose this does not discharge the employer's responsibilities in this area but, rather, should help the employer to fulfil those responsibilities. This section of the document is concerned with the steps the employer should take to make best use of the external services.

1.3. Most employers are confronted from time to time by the need to deal with legally or technically complex matters. Sometimes they may need to turn to external advisors like accountants and solicitors for help, and perhaps a management or engineering consultant. Consultants who can help tackle the assessment of risk at work relevant to health and safety matters should be seen in a similar light. With this in mind this part gives advice on:

- when to use an external service or consultancy;
- what such external services or a consultancy can do;
- how to choose the right external services or consultancy;
- how to judge the performance of the external services or consultancy.

External services and consultancies who can conduct risk assessment vary in size and ability and in the services they provide. For example some are large practices owned by insurance companies, some are independent businesses, some are university departments and some are sole traders working from home.

2. When to use a consultancy or other external services

2.1. In some Member States there may be national legislative or administrative arrangements for the use of external services in certain specified circumstances to carry out risk assessment. In other Member States the employer has the option to carry out these tasks using the enterprise's own resources or to enlist external services where this is considered necessary. External services will usually be appointed in an advisory capacity, and their activities should in any case be coordinated by those appointed by the employer to manage health and safety.

2.2. Where there are no national legislative and administrative arrangements for the use of external services Member States might advise employers of the matters to be

taken into account when engaging external consultants. The following might be appropriate:

1. The employer should aim to avoid:

   - turning to outside help on matters which should or could be handled within the employer's business by its own staff;

   - trying to cover for lack of essential training or of management or supervisory skills within the enterprise.

2. As a first step, in order to decide whether to enlist outside help the employer should arrange that within the enterprise the following approach is adopted:

   - analysis of the problem as far as can be done;

   - if there is a pattern of accidents or ill-health which cannot be explained, structure the search by asking: what? when? where? who? how? and why?;

   - if there is uncertainty about the nature of a risk or the right measures to deal with it, explore the wide range of advisory material and advisory services available, such as are mentioned in Part A, Section 1; they are powerful tools for answering many employers' questions;

   - consider whether the knowledge and skills are available within the organization to deal with problems of this sort;

     It might also be useful to consult with other bodies, such as trade associations, to obtain their views, and perhaps guidance on the use of external agencies for particular problems.

3. After the consideration of the points at 1 and 2 above there will none the less be times when the employer will conclude that the use of outside help is the right approach, for example:

   - it may not be feasible to employ directly all the knowledge and skills needed to handle every health and safety question that arises during a risk assessment, especially when working with new or complicated technology;

   - engaging a consultancy can be a good way of drawing on a larger pool of expertise, and bringing a high level of specialist skill to bear on a specific problem;

   - a new approach and an independent view may be what is needed;

   - it may be that within the business there is the necessary understanding but not the resource to spend analysing a complex problem in detail and planning a solution.

   This might be the case when there is a need to:

   - assess less obvious hazards, e.g. in complicated technical systems such as computerized systems which may or may not involve human interven-

tion. In these cases the causes of the hazards and/or the links between causes, triggering, development and effects might be difficult to identify and/or masked by the presence of interacting factors;

- assess the risks of an unfamiliar problem or of rare but potentially catastrophic events;
- examine the finer details of particular risks;
- devise novel technical measures for risk reduction (e.g. equipment for controlling emissions of toxic substances, preventing the transmission of noise or safeguarding dangerous machinery).

3. Selection of external services to make risk assessments

3.1. Workers or their representatives with specific responsibility for the safety and health of workers should take part or otherwise be consulted in advance and in good time by the employer on the selection of external assessors which is to be made, and subsequently on their findings and recommendations. The general requirements of the tasks of such assessors are discussed in Section 1.

3.2. In the first instance the specialist advice will need to be of a fairly broad and general nature. Broad-based health and safety specialists should be able to recognize and assess risk to health and risk of injury. They may advise on the kind of monitoring system needed to assess future performance, or to carry out systematic audits. They should be well versed in the relevant law and able to advise on its application.

3.3. In point of fact, the field of health and safety is so wide, involving so many scientific, technical and other disciplines, that often advice from more than one specialist may be required, not only for different hazards, but also at different stages in the assessment.

3.4. It is expected that employers will want to be satisfied as to the competence of any external agency or consultants they engage. How they do this is likely to depend upon practice in the Member State in which they are located. Some Member States may provide certifications of competence or qualifications of technical ability. In other Member States employers may have to rely on judgments based on such matters as technical qualifications offered, membership of professional organizations, specialization, evidence of experience, and reputation.

4. Briefing the external services: outline specification

4.1. In order for an external service to be able to conduct a comprehensive and effective risk assessment it is important that the employer provides an adequate, informative brief. An approach that is likely to be useful in order to provide a briefing is to write down what is required in the following way:

- the problem, as precisely as possible, and why it cannot be dealt with in-house;

- what the external services are to do;
- what will count as a successful outcome;

4.2. In addition, to help the external services to complete its task efficiently, it will be helpful if the brief sets down information on the following lines:

- information about the company or business;
- a clear statement of objectives;
- a detailed description of the problem, with, possibly, an assessment of hazards and risks;
- internal resources at the disposal of the specialist (including designated contacts);
- budget guidelines;
- time-frame;
- required method of reporting;
- any relevant special conditions;
- the criteria for success.

5. Deciding whether the external services have carried out the risk assessment properly

The employer can systematically check what the external services have done and whether this meets the employer's obligations to perform a risk assessment by obtaining the answers to a number of questions, for example:

- did the assessors ask searching questions that showed that they were getting to grips with the organization and risks?
- are the recommendations feasible?
- are the recommendations clear and precise?
- is it clear why those recommendations have been made?

6. Implementation

It is for the employer to ensure that the risk assessment prepared by a specialist is adequate and appropriate and that management and employees have been involved, and that the protective and preventive measures which have been identified are implemented.

PART B

RISK ASSESSMENTS AT WORK — AN APPROACH FOR SMALL AND MEDIUM-SIZED ENTERPRISES

Preliminary note:

Member States can use or adapt this guidance as they choose so as to be in conformity with their national legislative and administrative arrangements and so as to meet the needs of small or medium-sized enterprises in their territories.

1. Introduction

1.1. This part gives guidance to Member States in respect of employers in small and medium-sized enterprises. It suggests how to apply the general principles of risk assessment given in Part A to their businesses.

1.2. The employer in a small or medium-sized business has a duty to ensure the safety and health of workers in every aspect related to work, just as any other employer in big business has this duty. However special consideration of the needs for guidance to small and medium-sized enterprises is justified because:

- the staff resources and expertise available within the enterprise may be limited;
- of the lack of awareness of hazards and their associated risks which are outside the experience of an individual enterprise.

1.3. The arrangements made for such enterprises may vary. In some Member States there are specific legislative and administrative arrangements, whilst in others the employers may personally conduct risk assessments for their own enterprises.

Whichever situation applies the employer of a small or medium-sized enterprise can draw upon certain strengths when it comes to making a risk assessment. These strengths are a closer knowledge of the overall organization both on the part of the employer and the workers, and the fact that, as a generalization, the hazards that exist in small and medium-sized enterprises are of a type which is commonly occurring. They give rise to risks at work for which tried and tested control measures have been developed, and can be adopted for use.

1.4. However, even in small firms, there may be parts of the processes or activities where the risk is relatively complex to evaluate, and specialist assistance is necessary. Examples of this could be found where a small company uses complex lifting equipment, or steam plant. Other small companies will be specialists in their particular business activity, e.g. small chemical works. Clearly they will have to arrange for those who are to conduct risk assessments at work to be skilled and knowledgable in those activities. Such specialist resources might be available within such a business enterprise, but they might not. Where the resource is not available within the enterprise it should be obtained from external sources which might in some Member States include those provided especially for this purpose by the national authorities.

1.5. When it comes to carrying out risk assessments at work, the same principles should be followed as are set out in Part A. Thus a similar overall approach should be adopted, namely:

1. To keep clearly in mind the purpose of risk assessment: to enable the employer to take measures necessary for the safety and health protection of workers (see Part A, Section 1, Paragraph 2)

2. To keep in mind the key elements of risk assessment (see Part A, Section 1, Paragraph 3).

   (i) that it requires the consultation and/or participation of everyone at work, that is including managers, supervisors and workers and/or their representatives in accordance with national laws and practice;

(ii) to follow a procedure to:

- identify the hazards;
- identify who might be exposed to the hazard;
- assess the risk;
- consider if the risk can be eliminated, and if not identify control measures;
- ascribe a priority for action.

3. Plan the approach to be taken to risk assessment (Part A, Section 1, Paragraph 4)

- in particular to make sure that every activity, including out of normal hours, and workplace is covered by the assessment;
- always to apply the question first of all of whether an identified risk can be eliminated by doing away with the material, activity, etc. which gives rise to the risk;
- but always to consider the implications of any change that might result.

4. Act on the findings of the risk assessment.

1.6. Employers in small and medium-sized enterprises should be made fully aware of the additional considerations to be applied where they act as a subcontractor or engage a subcontractor. In such cases the assessment of risk should be made with close cooperation between the principal employer (main contractor) and the subcontracting employer in order to take account of how their work activities might affect the health and safety of each other's employers.

2. Selection of the person who conducts the risk assessment

2.1. When confronted by the duty to evaluate risks at work some employers in small and medium-sized enterprises are at a loss to know to whom to turn to carry out the work. In some Member States there may be arrangements for assessments to be carried out by appointed persons. In other Member States the assessment may be made by the employer or the employer may delegate the assessment or parts of the assessment to other persons, for example to supervisors or may arrange for the assessment to be made by external services. In any case, whoever does the assessment, it is the employer who is ultimately responsible for the assessment and that it is made by someone who has the necessary knowledge, information and competence.

What is important to remember here is that:

1. Where the employer decides who will make the risk assessment the selection should be arranged with the participation or consultation of the workers and/or their representatives.

2. It may well be possible to identify different employees or other persons with skills and knowledge in appropriate areas, e.g. electricians, draughtsmen.

3. Everyone at the workplace should be considered as having something useful to contribute to the risk assessment; all should be involved.

4. There will be information (such as standards, codes of practice) available to help the persons making the assessment. This information should be made available to all.

5. However, there may come a point at which the persons appointed to make an assessment consider that the assessment of a particular risk, such as exposure by inhalation to a chemical substance, is beyond their knowledge and limits of confidence. In such cases, this need for greater expertise should be acknowledged, and the necessary knowledge and skills obtained elsewhere (see Part A, Section 2).

2.2. In order to decide whether the person making the risk assessment has the necessary competence, information and knowledge employers should refer to Part A, Section 1, Paragraphs 7, 8 and 9. In practice, this means that whoever does the assessment should have a knowledge of:

- the management of health and safety, including setting out a clear policy on health and safety, organizing staff to ensure their commitment to health and safety, planning and setting targets for health and safety, including the employees in the assessment and risk control;

- the workplaces, the activities done by workers, the chemical substances, tools, resources, machinery, plant, transport, etc. used, including knowledge of their properties and condition and how they are used or operated;

- basic knowledge of the various hazards and their cause in the employer's area of business activity, how they interact and what effects they are likely to have;

- the legislative requirements and the rules, regulations and standards pertaining to their area of responsibility;

- the appropriate protective measures which have proved their worth in respect of comparable activities or at comparable workplaces. They must also have available, or know where to go for reference to standards established for the elimination, or control, of risks in the employment sector of their business activity.

3. Assessment of the risks from commonly occurring hazards

3.1. Assessment of the risks from commonly occurring hazards is in many cases a straightforward process based on judgment and requiring no complicated techniques. A useful approach is to check whether for the hazard in question the required or recommended protective measures, or those which have proved their worth in practice, are present, are applied and are effective.

3.2. Risk assessment must take into account all aspects, that is all the sources of hazards, in each possible operational status. For most small and medium-sized businesses the approach to risk assessment could be as follows:

1. Draw up a plan for the assessment which:

   - covers all parts of the premises on a geographical basis during normal working;
   - covers other work activities which take place away from the premises;
   - considers other normal activities which are not geographically specific, e.g. obtaining new plant or materials;
   - takes account of predictable situations which are not part of normal working, e.g. maintenance, annual shut-down;
   - takes account of employees at special risk, e.g. the disabled, pregnant women, young workers.

2. Put the plan into operation with a structured approach so as to ensure assessment of all relevant risks. A suitable structure can be based on the:

   - process or activity. This approach is appropriate where:

     the activity is repetitive (e.g. on a production line);
     where employees carry out the same task even though they may be based at different locations (unless the location itself has a significant effect on the risk);

   - location — this approach is appropriate where:

     activities are different at each location;
     the location itself is a significant hazard (e.g. construction work over water);

   - department (organizationally-related assessment). This is appropriate where employees in one department carry out a series of similar activities within that department (e.g. most office activities);

   - the type and extent of the hazard or of the risk. This is appropriate where special hazards or risks are well known and the assessment of these hazards or risks takes priority, e.g. electricity maintenance work, use of ionizing radiations.

3. Implement the plan by:

   - identifying hazards, e.g. chemical hazards identified from labels and safety data sheets, machinery hazards by reference to manufacturers' literature or published standards, physical hazards of falls etc. identified from first principles;
   - consultation and participation of workers and/or their representatives, including their observations of adverse health effects which may or may not be immediately linked to exposure to a specific hazard;

- taking note of information available from external prevention services (e.g. an occupational health service) on such matters as occupationally related ill-health, results of exposure monitoring, audiometry and matters of concern raised by employees;

- identify who might be exposed to hazards, and when;

- evaluate the risk arising from a hazard;

- consider elimination of risks;

- assess the control measures in use by comparison with current good practice, e.g. as provided by legislation, national technical guidelines, codes of practice, trade association guidance, etc.;

- identify where control measures are not adequate, or risk could be reduced by additional control measures to improve protection;

- identify areas where further risk assessment is required;

- prior tize actions to implement findings of risk assessment.

3.3. A step-by-step approach to risk assessment which Member States might find useful to adapt to the needs of their own small and medium-sized enterprises is offered in Annexes 1B and 2B.

4. Control of risks arising from work

4.1. Risk assessment is only a step towards preventing or controlling risks. Having evaluated the risks, employers need to decide:

1. Whether risks are preventable or avoidable, e.g. by considering whether the task or job is necessary, by using different substances or processes.

2. If risks are not avoidable or preventable, how to reduce the risk to a level at which the health and safety of those exposed is not compromised, e.g. replacing the dangerous by the non-dangerous or the less dangerous. For guidance on the control of risk to be achieved by these measures employers should be referred to specifications, in national legislation, national standards, published guidance and other such criteria published by national authorities.

3. Whether the steps which can be taken improve the level of protection afforded to workers with regards to safety and health.

4.2. In determining a strategy to reduce and control risks, employers should also be made aware of the following additional general principles, to:

- develop a coherent overall prevention policy which covers technology, organization of work, working conditions, social relationships and the influence of factors related to the working environment;

- combat the risks at source;

- adapt the work to the individual, especially as regards the design of workplaces, the choice of work equipment and the choice of working and production methods, with a view, in particular, to alleviating monotonous work and work at a predetermined work-rate and to reducing their effect on health;

- adapt to technical progress;

- give appropriate instructions and information to the workers.

- seek to control risks, where feasible, by means other than providing personal protective equipment for workers, e.g. local exhaust ventilation should be used rather than respirators. In other words, personal protective equipment should be the last option within the control strategy and should not be used as a substitute for other measures. However, personal protective equipment may be useful whilst other control measures are being implemented or developed.

4.3. A further important general principle of which employers need to be aware is that they do not transfer risks, either from one part of the enterprise to another, or off-site.

5. Use of personal protective equipment

5.1. It should be made clear to employers that personal protective equipment shall be used only if it is impossible to ensure the safety and health of employees by collective technical or organizational means.

5.2. If personal protective equipment is deemed to be necessary, it should be suitable and appropriate. The employer, or other person making the assessment, should carefully identify the risk against which protection is to be provided, and then select equipment which is designed for that task. The performance of the protective equipment should be checked from the manufacturer's data and the assessor confirm that this is adequate for the task. Then the assessor should consider the practical limitations which might arise from wearing personal protective equipment and might restrict the time for which it can be used by the worker, together with arrangements for storage, maintenance and training of workers to use the equipment.

5.3. For example, if goggles have to be worn to protect the eyes from flying particles, the assessor should first be satisfied that the risk cannot be avoided by doing the process in some other way. Once the assessor has checked this point, then goggles should be selected which have the strength to withstand the impact from the particles. It should then be checked that these goggles are suitable for the workers, and can adapt to any needs for wearing glasses or contact lenses. Other possible problems in use including misting of goggles, and discomfort from wearing for prolonged periods should be taken into account. Finally consideration needs to be given to storage, cleaning, maintenance and so forth of the goggles.

6. Prioritization of control measures

It will be helpful to advise employers as to the criteria which influence the priority for providing protective measures; for example:

- if serious injury or health damage (e.g. a long illness, or irreversible damage to health) could result from an identified hazard;
- the number of persons who might be affected by the hazard;
- knowledge of accidents or ill-health in similar workplaces;
- knowledge of accidents or ill-health arising from specific, identified hazards.

ANNEX 1B

A step-by-step approach to identifying and evaluating straightforward risks (Para 3.4.)

The following steps are advised:

1. Collect up-to-date information.
2. Carry out a survey — estimate risks, check control measures, and if necessary propose additional ones.
3. Lay down priorities.
4. Consider whether it is necessary to bring in other competent persons for risk assessment.
5. Keep a record.
6. Inform all persons concerned.
7. Monitor compliance.

When carrying out these steps it is important to remember to involve the workers and/or their representatives so that they are consulted and can participate.

1. Collect up-to-date information

Information is essential, especially on the following:

- known sector-specific hazards;
- protective measures required in relevant standards, rules and regulations;
- protective measures which have proved their worth;
- relevant criteria for making risk evaluations, e.g. safety risk phrases on labels;
- notice given by workers to their representatives or supervisors or employers concerning perceived risks.

2. Carry out a survey

Survey content

The aim is to ascertain where and in association with which activities known, sector-specific, hazards can occur. Identify where they occur, and whether the required, recommended or other sound practical protective measures are being applied at all times and in all places.

Type of survey

(i) Observation of activities or processes;

(ii) Workplace inspection;

(iii) Consideration of the way work is organized;

(iv) Special hazards or risks.

Conduct of survey

The survey can take the form of a comparison of the ideal situation with the actual situation, using:

- checklists relating to possible hazards and the appropriate form of control measures;
- checklists in respect of the protective measures which should be in operation for certain activities;
- operating instructions;
- data sheets for chemical substances including guidance on control measures;
- standards, rules and regulations.

This comparison exercise in relation to sector-specific protective measures cannot cover all the special features of a specific workplace or of specific activities. A judgment will have to be made whether any further protective measures are required.

3. Lay down priorities

The urgency of the requisite measures has to be ascertained by reference to a rapid evaluation of the risk (see Paragraph 5).

4. Consider whether it is necessary to bring in other competent persons for risk assessment

In carrying out the risk assessment and deciding on the appropriate measures, the persons concerned must at all times ask themselves whether their own abilities and knowledge are sufficient to make a correct evaluation of the health and safety situation.

In those Member States where the employer is left to make the arrangements for risk assessment, where the person making the risk assessment has any doubts, the employer should either take steps so that the assessor acquires the necessary skills or a competent person should be brought in to assist.

5. Keep a record

There should be a record of findings of matters of concern and this must include a record of wherever the risk has to be controlled by the maintenance of appropriate protective measures.

Such records can be used as a basis for:

- information to the persons concerned;
- monitoring to assess whether the requisite measures have been introduced;
- evidence to be produced for supervisory authorities;
- any revision if the circumstances have changed.

A record of at least the following details is recommended:

- name (and function where appropriate) of the person carrying out the examination, date of examination;
- undertaking, department;
- workplace, activity;
- hazard and the risk arising as a consequence;
- requisite protection measures (where appropriate, the regulation in which the measure is laid down);
- details of introduction of the requisite measures, e.g. name of person responsible, date;
- details of subsequent monitoring arrangements, e.g. dates of subsequent inspections, reference to competent persons.

6. Inform all persons concerned

All persons affected should be informed of the existence of the hazard, of any possible damage to which they might be subject and of all, requisite protective measures to prevent such damage.

7. Monitor compliance

Health and safety at work must be maintained at all times by regular checks with a view to ensuring that the protective measures are being complied with.

The latter two steps in the preceding paragraph are, in fact, essential components of risk management rather than the risk assessment process. They are the responsibility of the employer.

More detailed guidance on the assessment of the workplace, of work equipment and of hazardous chemicals is given in Annex 2B.

ANNEX 2B

Assessment of risks in a step-by-step approach

1. Assessment of workplaces

Definition

Workplaces include any place on the work premises to which workers have access in the course of their work including the means of access and egress.

Minimum requirements

The minimum requirements are set out in Directive 89/654/EEC of 30 November 1989. For assessment purposes, the national regulations must be taken into account, and these in turn must be at least equivalent to the provisions of Directive 89/654/EEC. Annexes I and II of the Directive should be consulted for further details.

There are minimum provisions in respect of:

- stability and solidity;
- electrical equipment;
- escape routes and emergency exits;
- fire detection and fire-fighting facilities;
- ventilation;
- room temperature;
- lighting;
- floors, walls, ceilings and roofs;
- windows and skylights;
- doors and gates;
- traffic routes — dangerous areas;
- escalators and travolators;
- loading ramps;
- room dimensions and room for manoeuvre at the workplace;
- rest and recreation facilities;
- rooms for pregnant women and nursing mothers;

- sick-bays;
- first-aid facilities;
- workplaces for the disabled;
- workplaces in the open.

Assessment operation

The assessment is based, as a rule, on a physical inspection of the workplaces, or where this is not feasible (e.g. for peripatetic work activities) on an assessment of the work activity (see Paragraph 3.2.).

Resources

Mainly in the form of checklists, designed to facilitate an actual/ideal situation based on the national regulations. Also reference to Directive 92/58/EEC on the provision of safety and/or health signs at work.

2. Assessment of risks caused by work equipment

Definition

Work equipment includes all machinery, apparatus, tools or plant used in the course of work.

Minimum requirements

For a number of items of work equipment, e.g. machinery, there are Community directives specifying minimum requirements which the manufacturer must meet before the equipment etc. is sold. This equipment will bear a 'CE' marking, as provided for by Council Regulation (EC) No 40/94 on the Community trade-mark.

Hazards due to work equipment

It is still necessary to assess the risks to health and safety once the equipment is installed and in use in the workplace.

Unacceptable risks may still occur as a result of, or in respect of, work equipment due for instance to:

- the nature of the workplace;
- the way work is organized;
- incompatible items of equipment;
- the cumulative effect of several items of equipment (e.g. noise or heat);
- different interpretations of the minimum requirements;
- the absence of European standards.

Assessment of commonly occurring hazards

What needs to be checked is:

- whether the manufacturer's instructions are adequate and are being complied with; whether all the safety facilities mentioned by the manufacturer are always operational;
- whether the ergonomic design of the equipment and of the workplace is geared to the person doing the work;
- whether the physical and psychological stress on the person doing the work is reasonable;
- whether the equipment can still meet the manufacturer's design specification in the place and under the circumstances in which it will be used;
- whether additional requirements which apply at a place of work are met.

Assessment proper

Normally, the assessment procedure covers all aspects together, i.e. the equipment, the associated activity and workplace, the hazardous chemicals used and the personal protective equipment.

Resources

These may be found in:

- instructions for use;
- checklists of protective measures;
- reference to relevant criteria or standards.

3. Assessment of risks to health arising from the use of chemical agents

Definitions

'Chemical agent' means any chemical element or compound on its own or admixed as it occurs in the natural state or as produced by any work activity, whether or not produced intentionally and whether or not placed on the market.

Occurrence

Chemical agents may:

- be used or intended for use in a process;
- occur in a working process or be the result of that process;
- be part of materials used for other purposes, e.g. cleaning, coolants, lubricants, paints.

Attention must be given to the manufacture, storage, conveyance, sampling, disposal and handling of chemical agents as well as the processing.

Employer's duties

The employer must be aware of the chemical agents present at the workplace. This is best achieved by keeping an inventory of all hazardous chemicals occurring at the workplace or intended for use at the workplace. A useful step is to record for each chemical and preparation the 'risk' and 'safety' phrases allocated them for the purposes of Directives 67/548/EEC and 88/379/EEC, as amended, where these are applicable. This could be done by means of manufacturers' or suppliers' safety data sheets.

This inventory must give details of:

- provisions regarding classification and identification;
- data sheets (including health and safety data sheets);
- written instructions on use or risk reduction;
- possible co-exposure with other chemicals.

The employer must carry out an assessment of all workplaces at which hazardous substances occur.

It is advised that apart from risks not considered significant, e.g. use of typing correction fluid in a well ventilated office, the assessment should be in writing and contain details of:

- the number of workers at risk;
- the nature, level, duration and type of exposure (to be ascertained by measurement where appropriate);
- occupational exposure limits including threshold values and guide values;
- all activities involving an enhanced risk;
- possible effects on health and safety;
- the requisite certification (if any);
- information required in the safety data sheet, which the supplier or importer is required to supply (pursuant to Article 10 of Directive 88/379/EEC, in accordance with Directive 92/32/EEC).

Identification of hazardous chemicals

Every container of a chemical substance should be labelled by the manufacturer to indicate its hazard status. The manufacturer should draw up a data sheet to this end. Where there is any doubt, the user should require the manufacturer or supplier to provide written information.

When chemicals are transferred to other containers, pipelines, etc. in the workplace, these too should be labelled to identify the contents.

4. Choice of personal protective equipment

Personal protective equipment shall be used only if it is impossible to ensure the safety and health of employees by collective technical or organizational means.

Definition

Personal protective equipment is equipment intended to be held or worn by the worker to obtain protection from hazards. Any kind of special equipment used by an employee with this aim in mind is deemed to be personal protective equipment.

Minimum requirements

The minimum requirements for health and safety in respect of the use of personal protective equipment are laid down in Directive 89/656/EEC. For assessment purposes, the national provisions must be complied with. These must be at least equivalent to the requirements laid down in Directive 89/656/EEC.

Assessment of personal protective equipment

The choice of personal protective equipment must be based on assessment including:

- ascertainment of risks which cannot be adequately reduced by any other means;
- ascertainment of properties which the personal protective equipment must comply with in order to provide the requisite risk protection without itself creating additional hazards;
- an assessment of whether the personal protective equipment available has the required properties.

The assessment and selection exercise should involve the workers concerned or their representatives.

Resources

- Results of the risk assessment of activities, workplaces, work equipment and hazardous substances.
- product description for personal protective equipment.

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