

Tripartite Working Group On Risk Assessment

PRACTICAL GUIDE TO THE RISK ASSESSMENT PROCESS

1. **AIMS**

The purpose of this guide is to provide advice on how suitable and sufficient assessments of risk can be carried out as required by Section 11 (1) of the new Mine Health and Safety Act 1996. The way a risk assessment is carried out depends very much on its final use. In this case, the risk assessment has to be carried out with the purpose of satisfying the other requirements of Section 11 of the Act. That is, the risk assessment shall be transparent and will be recorded in accordance with Section 11 (1)(c). The main purpose of the risk assessment is to enable mine managers to comply with the requirements of Section 11 (2). The risk assessment must also 'loop back' to become a continuous process as required by Section 11(3)(a).

The aim, therefore, of this guide is to explain the principles of the risk assessment process so that those developing their own approaches are aware of the key ingredients and some of the potential pitfalls. It emphasises the essential role of risk assessment to create a safety culture. It is not intended to be a guide to experts and, in many cases, those who are conducting risk assessments will need further training and advice on particular techniques and approaches.

The guide uses and defines certain terms which are also explained in the Glossary. These are shown in bold capitals in the text, where they are first used. It is strongly recommended that these definitions be used in the South African mining industry to prevent confusion and to ensure consistency.

2. **INTRODUCTION**

Many people already carry out risk assessments on a day-to-day basis during the course of their work. Already they note changes in working practices, they recognise unsafe working conditions and practices as they develop and they take the necessary corrective action. The new Act requires that this process should become more systematic and should be recorded so that the results are reliable and the analysis is complete. In particular, employers will have to undertake a systematic general examination of the work activities and then record the significant findings of the risk assessments conducted.

The risk assessment process at a mine should be continuous and should not be regarded as a one-off exercise. While it will be necessary to establish a baseline, the requirements of the new Act will not be satisfied by the creation of a single risk assessment report which stands for all time.

There are three essential forms of risk assessment. All are one part of a safety management system and need to carry out in mines under the new legislation. These are (not in order priority):

1. Baseline Risk Assessment

With the introduction of the new Act, mines will have to assess where they are in terms of risk, identifying the major risks and thereby establishing their priorities and a programme for future risk control. This baseline risk assessment will need to be comprehensive and may well lead to further, separate, more in-depth risk assessment studies. The baseline risk assessment should be periodically reviewed, say every one to two years, to ensure that it is still relevant and accurate. Any other studies (see 2 and 3 below) will need to be incorporated to achieve the 'complete picture'.

2. Issue Based Risk Assessments

As circumstances and needs arise, separate risk assessment studies will need to be conducted. These will normally be associated with a system for the management of change. An additional risk assessment will need to be carried out when, for example:

- A new machine is introduced into the mine
- A system of work is changed or operations are altered;
- After an accident or a 'near-miss' has occurred
- New knowledge comes to light and information is received which may influence the level of risk to employees at the mine. An example of this is when the scientific knowledge about the toxicity of a substance changes, making previous risk assessments with regard to that substance, invalid.

3. Continuous Risk Assessment

This is the most important form of risk assessment which should take place continually, as an integral part of day-to-day management. It may not use the more sophisticated hazard identification and risk assessment tools which are set out in paragraphs 1 and 2 (above), but in terms of ensuring safety and eliminating health risks in the workplace, this form of risk assessment is most powerful and important. It will mainly be conducted by frontline supervisors and it is essential that formal training be provided to enable this process to be efficient. Examples of continuous risk assessment include:

- Audits;

- General hazard awareness linked to a suggestion scheme; and
- Prework assessments using checklists.

In the latter case, the checklists will need to be developed following risk assessment exercises such as those described in 1 and 2 above. One outcome of the risk assessment process can be the development of a checklist which deals with the critical parts and critical processes, concentrating on the key performance indicators which show the effectiveness of the underlying systems of control. It is envisaged that prework risk assessments will be conducted daily, by the supervisor and the team from the area of work, in consultation with safety representatives. Also, as part of good management, those same supervisors will undertake Critical Task Analyses and Planned Task Observations, on an ongoing basis.

In this type of risk assessment, the emphasis is on hazard awareness through hazard identification. The prioritisation of hazards by thinking about risks will not be so important as this will already have been accomplished through the risk based techniques during paragraphs 1 and 2.

In general, a risk assessment involves identifying the hazards present in a work activity or associated with the layout of the premises, the construction of machinery and so on. This is followed by an evaluation of the extent of the risk involved taking into account those precautions already being taken. In this guide:

- a) A **HAZARD** is something that has the potential to cause **HARM**. This includes substances, machinery, methods of work or other aspects of work organisation;
- b) **RISK** is the **LIKELIHOOD** that the harm from a particular hazard will occur;
- c) The extent of the risk depends not only on the severity of the harm to a person but also on the number of people who will be harmed
Risk therefore reflects both the likelihood that the harm will occur and its severity in terms of the degree of harm and the number of people harmed.

3. **WHAT IS 'SUITABLE AND SUFFICIENT'?**

A suitable and sufficient risk assessment:

- a) means considering those risks which are likely to arise because of work and work activities
- b) should enable development and implementation of action, when appropriate, of systems to manage risk
- c) should be appropriate to the nature of the work so that it remains valid for a reasonable period of time.

This will enable the risk assessment process and the significant findings to be used positively e.g., to change working procedures or to introduce medium to long-term controls. The risk assessment process is the most important tool for changing the culture of a company by providing a basis for education and training.

For operations which don't change, the risk assessment should be such that it is not necessary to repeat it every time someone is exposed to a hazard in comparable circumstances.

For operations which do change often, or where the work activity may change fairly frequently, or the workplace itself changes and develops, or where the work involves workers moving from site to site, the risk assessment will have to concentrate more on the broad range of risks. The detailed planning and employee training should take account of those risks and enable them to be managed as and when they arise.

4. **PRACTICAL RISK ASSESSMENT**

There are no fixed rules about how the risk assessment process should take place. However, there are some general principles that should be followed to ensure that it is suitable and sufficient. The assessment carried out will very much depend on the nature of the work and the type and the extent of the hazards and risks. The process needs to be very practical and involve management and all employees, whether or not advisors or consultants assist with the process. Those involved in the risk assessment process have a duty of care to make sure that they and their colleagues do not make errors.

For simple situations, where only a few hazards exist or the hazards are simple and well known, suitable and sufficient risk assessment can be a very straightforward process based on judgement which requires no specialist skills or complicated techniques.

When dealing with complex, technical safety systems, more detailed and specialised techniques will need to be applied which actually quantify the levels of risk.

In all cases, specialised advice may be necessary so that the team carrying out the risk assessment thinks as widely as possible in terms of the potential hazard, some of which they may be unfamiliar with. The preparations of the team carrying out the risk assessment is very important to ensure they do not ignore events because of their lack of personal experience.

In most cases, several risk assessments will need to be carried out for a particular workplace or activity. This approach will need to be carefully structured to ensure that all potential hazards are considered. A different team, using different techniques, will approach the assessment of a workplace from different points of view, to ensure a complete assessment. The use of a systematic approach to risk assessment ensures that all similar risk assessments produce the same results.

The following general principles should be followed when conducting a risk assessment:

1. *All relevant risks and/or hazards should be systematically addressed;*
 - The aim is to identify the major risks in the workplace and not obscure those risks with an excess of information or by concentrating on minor risks
 - Consider aspects of the work such as the substances or equipment used, and the work process or organisation which have the potential to cause harm.
 - Take into account what safety controls and other measures already exist. The effectiveness of these controls needs to be carefully reviewed.
 - Be systematic in looking at hazards and risks. Remember that risk assessment is a process.
 - It should be ensured that all aspects of the work activity are reviewed.
2. *The risk assessment should address what actually happens in the workplace during the work activity:*
 - *Actual practice may differ from what is suppose to happen in written instructions, procedures, etc. This is frequently the way risk creeps into an operation unnoticed.*
 - *Especially consider non-routine operations. For example, maintenance operations and changes in methods of work.*
 - *Pay attention to interruptions or changes to the workplace (equipment, substances or methods of work and people) as these are frequent causes of accidents. Changes need to be carefully managed.*
3. *All employees and those who may be affected must be considered, including maintenance staff, security guards, visitors and contractors.*
4. *The risk assessment should highlight those groups and individuals who may particularly be at risk, such as the young and inexperienced, and those who are required to work alone or who have disabilities.*
5. *The risk assessment process should take into account the existing safety measures and controls, for example, codes of practice, procedures, guards, special instructions and so on. These may not be working properly. It is particularly important that this is objectively assessed.*
6. *The level of detail on a risk assessment should match the level of risk. The purpose is not to deal with every minor hazard. A suitable and sufficient risk assessment reflects what employers might reasonably foresee in terms of hazard in their workplaces.*

7. *In most cases it is better first to make a rough assessment to prioritise the risks. Then, in the second assessment more sophisticated techniques can be used to deal with the major risks.*

5. **PRATICAL HAZARD IDENTIFICATION**

The first and most important stage in the risk assessment process is the identification of hazards, in other words, the adoption of some systematic way of allowing us to 'see' the hazards present in the workplace. If the hazard identification is not carried out carefully, the subsequent analysis of risk and the development of risk control measures become pointless. The identification of hazards is not only an essential part of the risk assessment process, but also acts very effectively to change the way people think, causing them to act more safely and so become more proactive in hazard awareness.

There are many techniques and tools that can be used as part of the hazard identification process. This guide does not provide detailed explanations of all those available.

Safety professionals have an important role in the risk assessment process. However, they should not carry out risk assessments themselves, but should act as facilitators. They should advise management on the gathering of data, the selection of the team and the development of the risk assessment process. During that process, their role will be to guide and advise. After the risk assessment has been completed, the **safety professional** may assist in the development of the codes of practice which follow.

The first task when establishing a risk assessment process will be to define the scope of the separate risk assessment exercises. The intention should be that, through the risk assessment process, all of the mine and its activities are comprehensively reviewed and assessed. Some care is therefore needed in laying down the scope of the separate risk assessment exercises to ensure that no areas or activities are missed. In general, risk assessments are scoped in different ways:

E.g.

1. **Geographically** based, such as looking at shafts, haulages, workshops, etc;
2. **Functionally** based, such as trucking and tramming, blasting, winding operations, etc;
3. **Hazard** or issue based, such as the hanging wall, electricity, machinery, etc;
4. **Discipline** based, such as engineering, environmental, metalurgical, etc;

Some care should be taken if the approach to risk assessment is a mixture of the above three. Also, considerable care is needed when approaching the risk assessment from a hazard point of view, because of the danger that a

particular hazard will fail to be identified where the approach is based on a preconception of the areas greatest risks.

It is normally found that the first two of the above mentioned scopes are most effective in ensuring a comprehensive and complete risk assessment of an operation or activity.

Before any risk assessment can proceed, a team has to be selected, background information has to be gathered and processed and the team has to be prepared for the task ahead. It is vitally important that all these, and the subsequent hazard identification and risk assessments are carried out within a participative framework by involving all stakeholders and their representatives.

The gathering and analysis of information from on-mine sources and from external sources is an essential task before the risk assessment can start. This would normally be conducted by the **safety professional** on the mine and it is one of his more important duties. He should access the databases on the mine to assess the types and major underlying causes of past accidents and incidents. He should also review accident reports and investigations together with other records such as those maintained by engineering staff, log books and audit reports. Externally, he may be able to gather information from government and industry organisations or from publications and databases. Increasingly, the internet is a valuable means of gathering international data. All this data needs to be assimilated and converted into a useful format to prepare the team who undertakes risk assessment.

The creation of a team assessment is essential to ensure their "ownership" of the work and to help bring about culture change.

The importance of this is shown in figure 1, where each of the elements which build up culture change are outputs from the risk assessment process.

Three steps to culture change

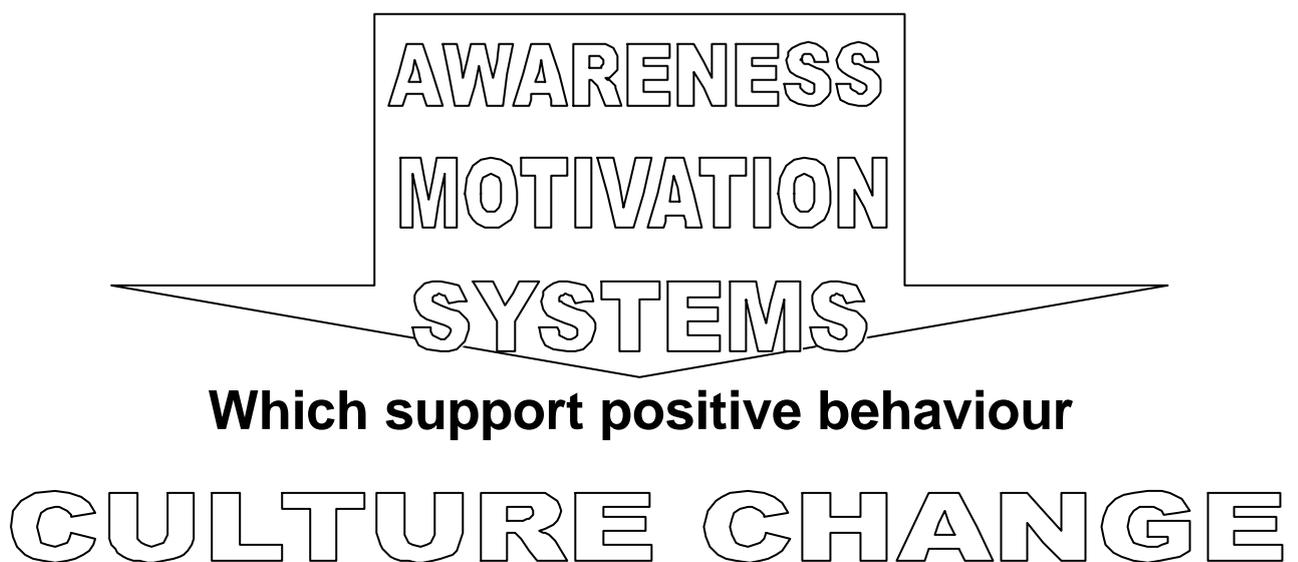


Figure 1

It is normal to select a team from the workplace being reviewed by taking a vertical slice through the management structure to the lowest levels in the organisation. Practically, this will mean the front line supervisor and the team from the workplace being assessed. Where necessary, specialist expertise should also be brought in, for example, with regard to psychological factors or ergonomics. The assembling of the risk assessment team is another important role for the **safety professional**.

Once the team has been assembled, it has to be conditioned for the work in hand. This will involve the safety professional presenting the analysed data, describing the scope of work, discussing the potential hazards the team might encounter and encouraging them to consider not just the superficial but also the underlying causes, thereby increasing their awareness. The purpose of this preparatory phase is to ensure that the team 'see' the hazards clearly when they go out into the workplace.

While visiting the workplace and seeing things more clearly are valuable steps of hazard identification, it is also necessary to use systematic approach to ensure a comprehensive and complete approach. There is a variety of tools available, from simple checklists to the most sophisticated quantitative techniques, to assist the team in identifying the hazards. The team should agree on the appropriate tools and approaches which they will use for hazard identification, and which are in keeping with the scope of the exercise. Where necessary, the **safety professional** will be able to advise and guide the team on the selection of the correct tools. He should also be able to advise them where additional training in the use of the technique or tool is required, before the team proceeds with the hazard identification exercise.

It is important that those conducting risk assessments should be competent and should receive formal training in order to be so. For example, it is essential that all front line supervisors are trained in Critical Task Analysis, Planned Task Observation and workplace inspections.

In general, hazard identification tools can be separated into two groups:

- **Top down techniques**

The technique involves working from a top event downwards to arrive at the underlying causes and also those of potential other events. Examples of this approach involve checklists, accident analysis, Fault Tree Analysis and brain storming. Task analysis in its many forms can also be classified as a top down approach;

- **Bottom up techniques**

The approach is one of breaking the system or problem into small components and then seeing how they or others may fail, building up to a major event. Examples of this type of technique include hazard and operability studies (HAZOP), which may address both hardware and people-ware systems, Failure Modes Effects Analysis (FMEA) and its extension in terms of Criticality Analysis (FME(C)A), and the various techniques associated with Human Reliability Analysis.

There are so many such techniques available, and the **safety professionals** should be aware of all these so that he can advise the team on the best approach. For the most complete and comprehensive identification of hazards, it is necessary to combine a top down approach with a bottom up approach. For example, the proper systematic causal analysis of accidents is complementary to a structured, predictive approach such as HAZOP or Structured What-if.

There are great benefits from extending the causal analysis of accidents to so-called 'near-misses'. In any workplace, there are more near-misses than accidents, and thorough analysis of these can be very informative. However, this does require a near-miss reporting system and these are only effective in those companies where barriers such as a 'blame-culture' have been removed. It can be seen from the definition of 'hazard' as a potential for harm, that near-miss investigation is a powerful form of hazard identification. A near-miss is a revealed hazard.

Whichever method is adopted, the approach to hazard identification should be holistic, that is, it should not concentrate on one type of hazard but should be broadly based and should seek to identify all possible hazards to those at work or who may be affected by the work activities. A convenient way to categorise hazards is to either consider whether they are due to some energy source or a chemical agent. Energy source hazards include electricity, radiation, gravity, noise and momentum. Chemical hazards include those which can be inhaled, ingested or absorbed through the skin or which can damage the skin by contact.

6. **RISK MEASUREMENT**

Once hazards have been identified, it is necessary to prioritise them so that action can be programmed and so that they can be dealt with in a way which will satisfy the **REASONABLY PRACTICABLE** requirement in the new act. The aim of risk assessment is to enable management to make better decisions. Risk assessment itself does not make decisions, it only provides the basis for the decision making. The setting of priorities is an important way to change employee understanding and to build hazard awareness. It also sets the direction for management.

The approach to risk measurement does not have to be complex or sophisticated. It should be sufficient to allow good decisions to be made, with confidence, and in a form that can be communicated to employees, inspectors and to other stakeholders to demonstrate competent and responsible management.

There are several approaches which can be used for the measurement of risk. These include Risk Matrix type approaches, whereby those who are carrying out the risk assessment categorise the consequences of the hazard and its likelihood separately and then combine them on a matrix to produce a priority. A simple example is shown in Figure 2. This example has been provided to show what risk matrix looks like. It is essential that mines generate their own. Such approaches have to be supported by clear explanations and descriptions so that the risk assessment team can all agree and can use the tool consistently. Alternatives include nomogrammes or risk ranking tables and equations and many of the hazard identification techniques such as FMECA and structured What-if already include their own approach. These all achieve

the same objective, they provide the risk assessment team with a means of deciding on **CONSEQUENCE** and **FREQUENCY** and then help them at a decision priority.

Example risk matrix

S E V E R I T Y	Multiple fatalities	1	2	3	4
	Fatality	2	3	4	5
	Reportable accident	3	4	5	6
	Loss time accident	4	5	6	7
		<i>Once a month</i>	<i>Once a year</i>	<i>Once every 10 years</i>	<i>Once in a lifetime</i>
	F R E Q U E N C Y				

Figure 2

The numbers on the matrix indicate priority (1=High, 7=Low)

Whatever system is used, it should have the following basic components:

Consequence assessment

Here the degree of harm from the identified hazard is assessed in terms of the potential severity of the injuries or ill health and/or the number of people potentially affected.

Frequency (likelihood)

This is normally a compound of two separate factors. Firstly, **EXPOSURE** which is an analysis of how often and for how long the employees involved are exposed to the hazard. Secondly, it includes an analysis of **PROBABILITY**. That is the chance that a person will be harmed during the exposure period.

Even if no formal system for prioritisation of risks is used, all of the above three components of the risk should be considered qualitatively during any risk assessment. To demonstrate this, we will use the example of a rotating shaft between two machine components. A risk assessment team might find this in a workplace and, to measure the risk to prioritise it, would follow these steps:

1. Hazard

The rotating shaft has the potential to cause harm.

2. Risk

The risk is the likelihood that a person will be harmed by the rotating shaft.

3. Consequences

The degree of harm will vary according to the characteristics of the shaft. If the rotation is slow, with a small diameter and easily and rapidly stopped, the consequence could be friction burns. If the rotation is fast and it is not easily stopped, the consequence could be amputation or even death.

4. Exposure

To assess how often people are exposed to the hazard, we need to consider for how long the machine runs, and how many are present.

5. Probability

The chance that a person will be harmed is determined by assessing, while the machine is running and people are present, the chance that a person will come into contact with the rotating shaft. One needs to consider those reasonably foreseeable circumstances where a person could get near enough to the shaft to become entangled. For example, one should consider normal operations, when someone has to work near to the shaft or, possibly, reach over the machine to reach machine controls. One also needs to consider those people who have to pass by the hazard and who could trip and fall and therefore come into contact with the shaft. Finally, one also needs to consider infrequent, but planned operations such as maintenance, where people may need to work close to the shaft when it is rotating.

The analysis of these three components of the risk not only enables one to prioritise, but also helps one to develop appropriate risk control measures. Using this and the risk control strategies specified in the Mine Health Safety Act (Section 11(2)), the following strategies could be considered:

a) Elimination

One should ask the question whether one could remove the rotating shaft or whether one, in fact, needs a machine of that design in that location.

b) Control the risk at source

This strategy may involve guarding the shaft, moving maintenance points away from the machine, or moving the machine itself into a safe position such as an elevated location, where access is only allowed using a permit to work system. One could minimise the risk by installing a clutch on the shaft so that if entanglement occurs, the injury is minimised. In addition one could provide a hazard awareness training programme so that people keep away from such dangerous parts.

The provision of personal protective equipment is not appropriate in the case of dangerous machinery.

Whichever approach is taken to prioritise risks, it should be ensured that high frequency and high consequence hazards are allocated the highest priority. Those with low frequencies and low consequences should be given low priority and those with either high frequencies and low consequences, or low frequencies and high consequences should be considered medium priority. This is shown in Figure 3. It is particularly important that high consequence events with low frequency are not ignored.

Prioritising Risks	
	I M P O R T A N C E
High Consequences, High Frequency	
High Consequences, Low Frequency	
Low Consequences, High Frequency	
Low Consequences, Low Frequency	

Figure 3

7. REPORTING AND RECORDING

It is vitally important that the risk assessment is recorded so that there is a reliable statement and evidence of what appropriate actions management is taking to protect health and safety. The risk assessment need to be an integral part of an employer's overall approach to health and safety, and its results need to be linked to other health and safety records and documents, such as the statement of health and safety policy. Ultimately, it should become an integral part of a company's overall management system.

Whatever the format of the risk assessment report, it should be easily accessible by employees, their representatives and inspectors. The record of the risk assessment may consist of several documents which describe procedures and safeguards, the approach used and the results of the exercise. Although recording of the risk assessment process is important, the generation of a system on paper alone is not sufficient to ensure compliance with section

11 of the mine health and safety act. Producing documentation should not detract from the major purpose of risk assessment; that is, to improve the management of risks and thereby to ensure the health and safety of employees.

It is vitally important that the recorder of the risk assessment reports those findings which are judged to be significant. These include:

- a) The major hazards identified in the assessment. That is, those hazards which, if they are not properly controlled pose serious risks to employees or others who may be affected.
- b) A review of the existing safety measures and the extent to which they are effective in controlling the risks
- c) Those who may be affected by the significant risks or major hazards including those groups and employees who are especially at risk

8. **PREVENTATIVE AND PROTECTIVE MEASURES**

The way risks have to be controlled is detailed in Section 11(2), of the Act. If possible, risks should be eliminated. If this is not possible, they should either be mitigated/controlled or minimised or, if all else fails, personal protection should be provided. The types of preventative and protection measures that need to be provided for a particular risk will be one of the most important outcomes of the risk assessment process. In deciding upon those measures, the following principles may provide guidance:

- a) If possible, it is always best to **avoid a risk altogether**, by using a different approach, substance or method of work.
- b) Risks should be **combated at source** rather than by adopting secondary measures. For example, if steps are slippery, treating or replacing them is always better than providing a warning sign.
- c) Wherever possible, **work should be adapted to the individual** rather than expecting the individual to adapt to the work. This means that the design of the job and the workplace, including the choice of equipment and working methods, are important considerations. Particular care should be taken to alleviate monotonous work and to establish a work rhythm. These are very important approaches to reducing risk.
- d) When treating risks, **advantage should be taken of technological and technical progress**. Just because solutions attempted in the past have failed, does not mean that one should not look for new opportunities for improving working methods and making them safer.
- e) The adoption of risk prevention measures must be **part of a coherent policy** and approach to safety management which acts to progressively reduce those risks which cannot be prevented or avoided altogether. This must take into account the way the work is organised, the working conditions, the working environment and, particularly, relevant social

factors. Risk reduction measures taken in isolation are likely to fail. They must be part of an ongoing cycle of risk management that involves performance measurement, goal setting, feedback and analysis.

- f) Those measures which **protect the whole of the work force** should be given a priority to yield the greatest benefit. In other words, collective protective measures should be given priority in the interests of net benefit.
- g) Whatever the protection provided, employees and those affected **need to understand** what they must do to make sure the protection works. All controls will fail unless they are backed up with adequate training and supervision.
- h) Of greatest importance is that measures to avoid, prevent and reduce risks need to be an **accepted part of the approach and attitudes**, at all levels of the organisation, applied to all its activities. Without an active health and safety culture supported by all levels of the organisation, isolated risk reduction initiatives will fail.

9. REVIEW AND REVISION

Section 11 (3)(a) of the new Act requires managers to review and, if necessary, modify their risk assessments since they should not be a one-off activity. Risk assessment is a continuous process and as work changes, the hazards and risks may change and therefore the risk assessment process must also change. If an accident occurs, or if more is learnt about hazards in the workplace, one may need to review or modify one's risk assessments. Hazards may exist which have not been anticipated in a risk assessment and which will require further, appropriate preventative and protective measures.

After an accident has occurred, it is important to go back to the risk assessment to see:

- Whether one anticipated the possibility of the accident which has occurred;
- Whether one decided to prevent that accident;
- If so, why one's preventative measures did not work
- If one did not anticipate that accident, does one need to revise one's risk assessment process to ensure that it is suitable and sufficient;
- If one did anticipate the accident but decided to tolerate the risk, was this decision valid;
- Why the accident occurred and what should be done to prevent similar accidents as far as is reasonably practicable.

The manager will need to review the risk assessment if there are any changes or developments that suggest it may no longer be valid or that it can be improved. It is good practice to plan to review risk assessment at regular intervals - the time between reviews being dependant upon the nature of the

risks and the degree of change likely to take place in the work activity. Such reviews are part of good management/business practice.

10. TEN STEPS TO EFFECTIVE RISK ASSESSMENT

The above guidance can be summarised in the following ten steps:

- 1) make sure the risk assessment process is practical and realistic.
- 2) Involve as many people as possible in the process, especially those at risk and their representatives.
- 3) Use a systematic approach to ensure that all risks and hazards are adequately addressed.
- 4) Aim to identify the major risks; don't waste time on the minor risks, don't obscure the process in too much detail.
- 5) Gather all the information you can and analysis it as well as possible before starting the risk assessment.
- 6) Start by identifying the hazards.
- 7) Assess the risks arising from those hazards, taking into account the effectiveness of the existing controls
- 8) Look at what actually occurs and exists in the workplace and, in particular, include non-routine operations.
- 9) Include all employees, visitors and contractors.
- 10) Always keep a written record of the assessment, including all assumptions you make, and the reasons for those assumptions.

11. **GLOSSARY**

The following terms have been used in this guide and it is recommended that they be followed by all those conducting risk assessments under the new Act.

CONSEQUENCE

The potential degree of harm, the potential severity of injuries and/or ill health, and/or the number of people potentially affected.

EXPOSURE

How often and for how long employees are exposed to a hazard.

FREQUENCY / LIKELIHOOD

Chance per unit time, (usually per year); Exposure X probability

HARM

Injuries, occupational diseases or losses

HAZARD

Conditions, circumstances or objects with the potential to cause harm

PROBABILITY

Chance that a person or persons will be harmed during the exposure

REASONABLY PRACTICABLE

Means practicable having regard to:

- a) the severity and scope of the hazard or risk concerned;
- b) the state of knowledge reasonably available concerning that hazard or risk and of any means of removing or mitigating that hazard or risk;
- c) the availability and suitability of means to remove or mitigate that hazard or risks; and
- d) the cost of removing or mitigating that hazard or risk in relation to the benefits derived therefrom.

RISK

The likelihood that harm from a particular hazard will occur ('the chance of harm or loss'). Consequence X frequency.