



CARRAIG SAFETY CONSULTANTS LTD.

Carraig Safety Consultants

Safety Management

QQI Level 6



Format 1: Qualitative Format : LMH System

The simplest form of Risk Assessment is to classify Risk as

Low = very unlikely that an accident or incident could occur

Medium = likely that an accident or incident could occur

High = very likely that an accident or incident could occur



This format is acceptable but can be subjective on behalf of the person carrying out the Risk Assessment



Format 2: Quantitative Format : 1 -10 System



You may also apply a Numerical Scoring System to this Risk Format where

Low Risk is Scored **1-3**

Medium Risk is Scored **4 -6**

High Risk is Scored **7-10**



HAZARD IDENTIFICATION

Who Conducts Hazard identification:

- Only people with a thorough knowledge of the area, process or machine under review should carry out a hazard identification survey.
- In conducting the hazard identification survey you should use different sources of information to help identify hazards.
 - **Previous Accident Reports**
 - Identify trends, common threads, near misses could be centred around a particular person or confined to a certain time of day or week. This knowledge will assist during the risk assessment and control phases of the risk management process.





HAZARD IDENTIFICATION

- In conducting the hazard identification survey you should use different sources of information to help identify hazards.
 - **Physical Inspection of the workplace**
 - Physical inspection requires an inquiring mind, lateral thinking and the ability to be and remain open minded.
 - **Brainstorming**
 - Conduct group meetings with people who are familiar with the operation of the area under review, recording all ideas and thoughts relating to possible hazards, and then sorting into some order of priority.





HAZARD IDENTIFICATION

- In conducting the hazard identification survey you should use different sources of information to help identify hazards.
 - **Manufactures Instruction Books**
 - Often provide advice and warnings regarding safety and health issues. Manufactures information, including MSDS sheets should always be reviewed to ensure the products in use are the safest available and do not have hidden hazards.
 - **Ask, “What if.....?”**
 - Try to anticipate how human behaviour, plant, and systems failure could combine to create a hazardous situation.
 - Constantly ask yourself “What if....?”





RISK ASSESSMENT

Risk Assessment:

- Risk assessment is the process of evaluating a **HAZARD** to determine the level of action required to reduce a risk to an acceptable level.





RISK ASSESSMENT



Risk: The possibility of an unwanted event occurring.



RISK ASSESSMENT

Risk Assessment:

- When evaluating the risks imposed by a hazard, you should consider both the;
 - **Severity, &**
 - **Probability**of the event happening.
- Judging how likely it is that something will happen or what its potential consequences might be is like predicting the future.
- You can't really be sure; you can only make a 'best estimate' on the basis of the information available.



RISK ASSESSMENT

Probability:

- This is defined as the chance of an event actually occurring. In the context of risk assessment the event referred to is any event which may cause injury or harm to a person.
- When making an assessment of likelihood, you must establish which of the following categories most closely describes the likelihood of the hazardous event occurring;



RISK ASSESSMENT

Probability:

- **Very Probable** - - Could happen frequently
- **Probable** - - Could happen occasionally
- **Possible** - - Could happen, but only rarely
- **Remote** - - Could happen but probably never
will.



RISK ASSESSMENT

Probability :

- When evaluating the probability / likelihood of an accident, a factor that will modify the likelihood category is exposure.
- Exposure is a measure of how often or how long a person is actually exposed to a hazard, e.g. ;
 - **Very Rare** - - Once per year or less
 - **Rare** - - A few times per year
 - **Unusual** - - Once per month
 - **Occasional** - - Once per week
 - **Frequent** - - Daily
 - **Continuous** - Constant



RISK ASSESSMENT

Probability :

- It is a common mistake to place too much emphasis on the mitigating effects of a low exposure level.
 - Just because a person is not exposed to a hazard very often, does not always mean we can take fewer precautions.

Key Point:

- The certainty or probability of an accident happening *is more important* than how often a person is exposed to a hazard.



RISK ASSESSMENT

Probability :

- When assessing 'probability' - remember we are only assessing the possibility of an accident happening.
- As part of our assessment of likelihood we must consider how often and for how long the person is at risk, however this is of lesser importance than the certainty of an accident occurring.

Remember the Key Point:

- The certainty or likelihood of an accident happening *is more important* than how often a person is exposed to a hazard.



RISK ASSESSMENT

Severity:

- Consequence is a measure of the expected severity should an accident occur.
- When assessing the consequences of an accident, the most severe category that one would reasonably expect to be the outcome of the accident should be selected.
- The consequences of an event can be categorised as follows: -



RISK ASSESSMENT

Severity :

- **FATAL** - - Death
- **MAJOR INJURIES** - - Normally irreversible injury or damage to health requiring extended time off work to effect best recovery.
- **MINOR INJURIES** - - Typically a reversible injury or damage to health needing several days away from work to recover. Recovery would be full & permanent.
- **NEGLIGIBLE INJURIES** - - Would require first aid and may need the remainder of the work period or shift off before being able to return to work.



RISK ASSESSMENT

Severity :

- If the position of the danger adds to the consequences in the event of an accident happening, then the added consequences must be taken into consideration and the consequence rating increased.
- When making a risk assessment all aspects of likelihood and consequences should be taken into consideration.
- The interrelated parameters of likelihood and consequences can easily be presented on a simple risk assessment matrix.



RISK ASSESSMENT

Risk Matrix:

SEVERITY	PROBABILITY			
	<i>Very Probable - 4</i>	<i>Probable- 3</i>	<i>Possible - 2</i>	<i>Remote - 1</i>
<i>Fatality - 4</i>	HIGH - 16	HIGH - 12	HIGH - 8	MED - 4
<i>Severe Injuries- 3</i>	HIGH - 12	HIGH - 9	MED - 6	MED - 3
<i>Serious Injuries- 2</i>	HIGH - 8	MED - 6	MED - 4	LOW - 2
<i>Minor Injuries - 1</i>	MED - 4	LOW - 3	LOW - 2	LOW - 1

1-3 = Low – monitor, no further action; 4-6 = Medium – Take action to reduce risk, monitor; 7-11 = High – Stop activity and take action and monitor;
12-16 = Very High – Stop all Activity Immediately, inform Company and Site Management, take immediate action.



RISK ASSESSMENT

Risk Matrix: *worked example*

- If we consider the likelihood of an accident whilst driving a car and the consequences, statistically it is highly unlikely that we will have an accident and the worst consequence would be a fatality.
- From the matrix you can see the risk is in the medium range which means that we make every effort to reduce the risk of an accident by such means as driver training, road management and vehicle design.



RISK ASSESSMENT

Risk Matrix:

- When developing risk control strategies any item with a high rating should be addressed first.
- Using the matrix it would be normal to develop a list of hazards with highly rated hazards to be tackled first at the top of the list.



RISK ASSESSMENT

Risk Control:

- When a risk assessment has identified a hazard as having unacceptable risks we have to put in place Control Measures to eliminate the risk or reduce the risk to an acceptable level.





RISK ASSESSMENT



Controls:

Control: the measures we take to eliminate or reduce the risk to an acceptable level.



Principles of Prevention



*Schedule 3. Section 8
of the
Safety, Health & Welfare at Work
Act 2005



9 Principles of Prevention *

The Nine General Principles of Prevention are set out by the Safety, Health & Welfare at Work Act 2005 and take into account that all workplace risks, cannot be eliminated completely, however these principles should be adopted to in order to reduce the risk as far as is reasonably practical.

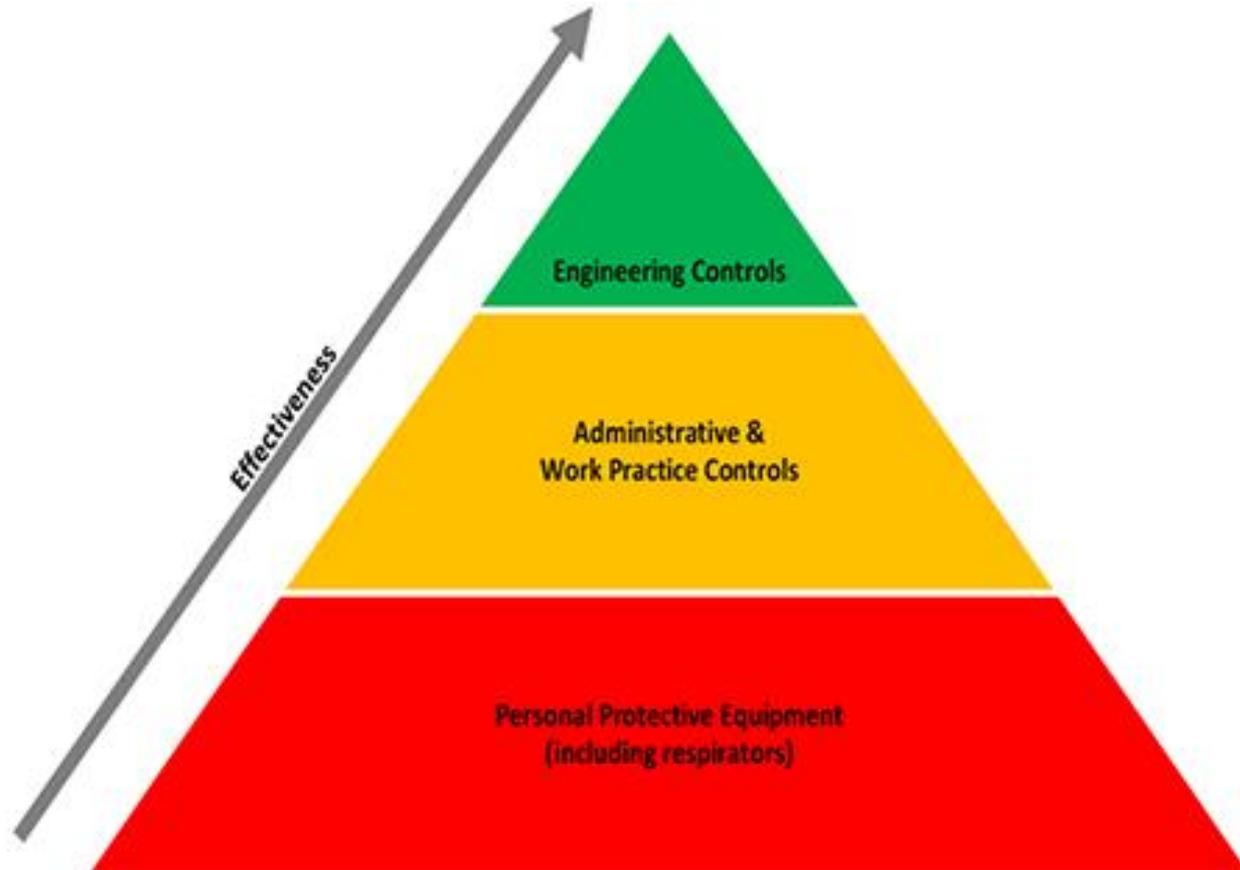
- The avoidance of risks.
- The evaluation of unavoidable risks.
- The combating of risks at source.
- The adaptation of work to the individual, especially as regards the design of places of work, the choice of work equipment and the choice of systems of work, with a view, in particular, to alleviating monotonous work and work at a predetermined work rate and to reducing the effect of this work on health.
- The adaptation of the place of work to technical progress.
- The replacement of dangerous articles, substances or systems of work by safe or less dangerous articles, substances or systems of work.
- The giving of priority to collective protective measures over individual protective measures.
- The development of an adequate prevention policy in relation to safety, health and welfare at work, which takes account of technology, organisation of work, working conditions, social factors and the influence of factors related to the working environment.
- The giving of appropriate training and instructions to employees.

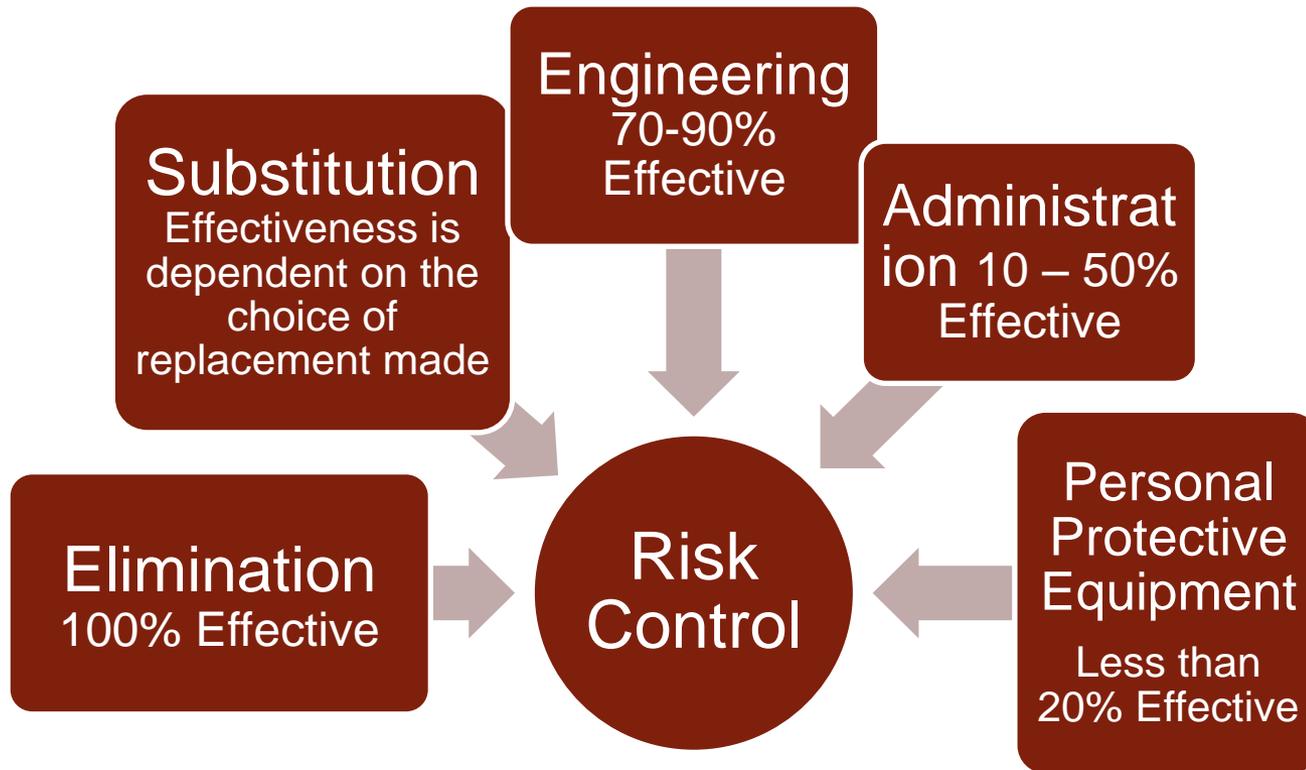


Principles of Prevention

The 4 main principles of prevention are:

- 1. Eliminate the risk
- 2. Isolate the risk
- 3. Restrict access
- 4. Use of PPE







Risk Control Hierarchy Explained!

- Elimination of hazard: examples include the proper disposal of redundant items of equipment or the removal of excess quantities of chemicals. The elimination of hazards is 100% effective
- Substitution of hazard: examples include the replacement of hazard work practices with less hazardous systems of work. The effectiveness of substitution is wholly dependent on the choice of replacement.
- Engineering controls: examples include the installation of guards on hazardous equipment, the installation of emergency stop buttons on machinery. The effectiveness of engineering solutions is around 70 - 90%.
- Administrative controls: include training and education, job rotation to share the load created by demanding tasks, planning, scheduling certain jobs outside normal working hours to reduce general exposure, early reporting of signs and symptoms, instructions and warnings, etc. The effectiveness of administrative controls ranges from 10 to 50%. They typically require significant resources to be maintained over long periods of time for continuing levels of effectiveness.
- Personal protective equipment: includes safety glasses and goggles, earmuffs and earplugs, hard hats, toe-capped footwear, gloves, respiratory protection, aprons, etc. Their effectiveness in realistic work situations does not exceed 20%.



RISK ASSESSMENT

Hierarchy of Control:

- The Hierarchy of Control list usually comprises:
 1. Elimination
 2. Substitution
 3. Isolation
 4. Engineering Controls
 5. **Administrative Controls** (can be included)
 6. Provision of Personal Protective Equipment



RISK ASSESSMENT

Hierarchy of Control:

Elimination

The most satisfactory method of dealing with a hazard is to eliminate it. Once the hazard has been eliminated the potential for harm has gone.

Example: The dangers associated with transporting an explosive called Anfo are known and documented. Anfo is made by simply mixing ammonium nitrate with fuel oil. Both constituents are safe in isolation but when mixed they become unstable. The dangers of long distance transport can be removed by not mixing the component parts until they are on site.

By this simple expedient we have eliminated the hazard.



RISK ASSESSMENT

Hierarchy of Control:

- **Substitution**

- This involves substituting a dangerous process or substance with one that is not as dangerous. This may not be as satisfactory as elimination as there may still be a risk (even if it is reduced).

Example: many chemicals can be substituted for other safer chemicals which perform in the same manner but do not have the same dangers e.g. water based paints rather than those that contain lead.



RISK ASSESSMENT

Hierarchy of Control:

– Isolation

- Separate or Isolate the hazard from people. This method has its problems in that the hazard has not been removed. The guard or separation device is always at risk of being removed or circumvented.

Example: A guard is placed over a piece of moving machinery. If the guard is removed for maintenance and not replaced people are again at risk.



RISK ASSESSMENT

Hierarchy of Control:

- **Engineering Controls**
 - Engineering solutions usually involve modification and /or redesign. This can be done by reducing the level of the risk through improvement control measures.

Example: A machine which emanates high levels of noise can be fitted with buffers and sound attenuation.



RISK ASSESSMENT

Hierarchy of Control:

- **Administrative Controls**

- Administration solutions usually involve modification of the likelihood of an accident happening. This can be done by reducing the number of people exposed to the danger and providing training to those people who are exposed to the hazard.

Example: We can appreciate that an electrician is still at risk, but their training is such that the risks are reduced to an acceptable level.

Administrative solutions also include danger signs, and written systems of work such as those for working in confined spaces and lock out procedures.



RISK ASSESSMENT

Hierarchy of Control:

- **Provision of Personal Protective Equipment**
 - Provision of personal protective equipment should only be considered when all other control methods are impractical, or to increase control when used with another method higher up in the Hierarchy of Control.

Example: To remove the possibility of a person dropping something on their foot in a workshop situation would be impracticable as it would involve securing every movable object large enough to do damage if it fell on a person's foot.

The practicable solution is to provide every person at risk with safety footwear.



RISK ASSESSMENT

- **Hierarchy of Control:**

- Controls are not mutually exclusive, several in the hierarchy may be needed to obtain the level of control necessary

Key Point:

- It is crucial to apply the control measure from as **high** on the hierarchy of control list as practicable.



RISK ASSESSMENT

- **Monitoring and Review:**

- Review is an important aspect of any risk management process. It is essential to review what has been done to ensure that the controls put in place are effective and that they have not introduced new hazards.
- The lesson to be learnt here is that however good the initial risk management process was, there is always the possibility that something will be overlooked and not addressed in the initial stages.
- The review allows further modifications to be carried out.



RISK ASSESSMENT

Conclusion:

- Hazard identification, risk assessment, control and review is not a task that is completed and then forgotten about.
- Hazard identification should be properly documented even in the simplest situations.
- Risk assessment should include a careful assessment of both ***probability*** and ***severity***.
- Control measures should conform to the recommendations of the ***hierarchy of control***.



RISK ASSESSMENT

- The risk assessment must be reviewed and amended if necessary –
- if it is no longer valid or there is reason to believe it is no longer valid,
- if there has been a significant change in the matters to which it relates.



RISK ASSESSMENT

- Accidents, dangerous occurrences, incidents of occupational ill health or near-miss incidents may trigger a review of the risk assessment.
- Such incidents should be investigated with a view to determining if their immediate and underlying causes require remedial action and a consequential review of procedures.
- Short term control measures, in particular, need to be reviewed periodically within the overall remedial plan.



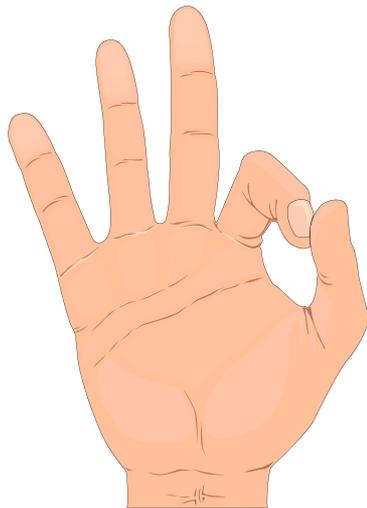
TAKE **five**

minutes of your day today to complete a risk assessment.

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<i>Minor Injuries - 1</i>	MED - 4	LOW - 3	LOW - 2	LOW - 1



TAKE five



to stay
alive.



Recap

