Construction Hazard and Risk Control

Lecture **Title:** Risk Assessment and Controls- DO

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Undergraduate Diploma in Occupational Health and Safety

Risk Assessment and Controls Learning Objectives

- Explain the principles and practice of risk assessment
- Principles of prevention and mitigation
- Factors to be considered when developing and implementing a safe system of work.
- Role and function of a permit- to work system.

SUBSIDIARY LEGISLATION 646.11- General Provisions for Health and Safety at Workplaces regulations

- 10.(1) It shall be the duty of every employer and of every self-employed person to carry out, or to ensure that is carried out, a suitable, sufficient and systematic assessment of all the occupational health and safety hazards which may be present at the place of work and the resultant risks involved concerning all aspects of the work activity.

  Such assessments shall consider the risks to the health and safety of workers and of self-employed persons to which they are exposed whilst at work, as well as the risks to the health and safety of other persons, including visitors to the place of work, which risks arise out of, or in connection with the work being carried out, or by the conduct of the undertaking:

SUBSIDIARY LEGISLATION 646.11- General Provisions for Health and Safety at Workplaces regulations

- Provided that when carrying out such assessments, an employer and a self-employed person shall also take into consideration changes to the work activities being carried out and to the workplace and shall take appropriate action.

(2) Where five or more workers are employed, an employer shall keep in his possession written or retrievable electronic copies of such assessments and shall ensure that they are updated regularly.

(3) An employer and a self-employed person shall decide on the protective measures appropriate to the nature of the work being carried out which are required to be taken following these assessments and, if necessary, the protective equipment to be used.

(4) The assessments referred to in this regulation shall be reviewed whenever there is any major change in working conditions, or whenever the employer or self-employed person have reason to suspect that they are no longer valid

Principles and practice of risk assessment

646.11 Legislation requires written suitable and sufficient risk assessment if there are five or more employees.

Suitable and sufficient means:

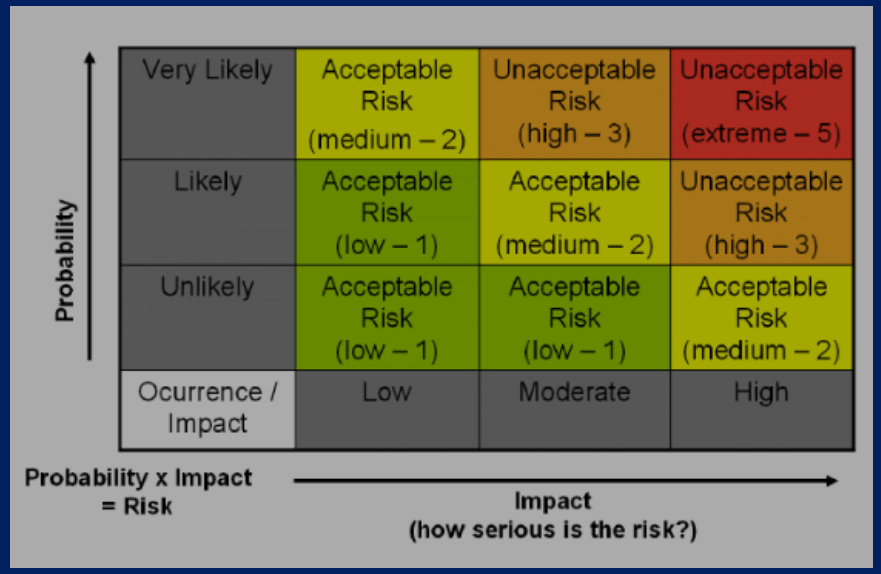
- identify significant risks only;
- identify measures required to comply with legislation; and
- the assessment should remain appropriate and valid over a reasonable period of time.

Forms of Risk Assessment

- Quantitative - calculated from risk = likelihood × severity

Forms of Risk Assessment

- Qualitative – descriptor (high, medium or low) used to describe timetable for remedial action



- Generic – covers similar activities or work equipment

Basic Risk Assessment Template

What is the hazard?	Who might be harmed?	How might people be harmed?	Existing risk control measures	Risk rating			Additional controls	New risk rating (Residual)			Action/ monitored by whom?	Action/ monitored by when?
				L	C	R		L	C	R		

Risk assessment team requirements

- all need training in risk assessment
- leader should have health and safety experience
- all need to be competent to assess risks in area under examination
- all need to know their own limitations
- include local line manager in the team
- at least one team member with report writing skills

Health Risks- Step 1 Hazard Identification

1. Chemical – exhaust fumes, paint solvents, asbestos
2. Biological – legionella, pathogens, hepatitis
3. Physical – noise, vibration, radiation
4. Psychological – stress, violence
5. (Ergonomic – musculoskeletal disorders).

INTRODUCTION
RISKS TO YOUR SKIN
RISKS TO YOUR MUSCLES, BONES AND JOINTS
RISKS TO YOUR HEARING AND TOUCH
RISKS TO YOUR WELLBEING
WHERE TO GET EXTRA HELP AND SUPPORT

Persons at Risk- Step 2

- employees, agency/temporary workers, contractors, shift workers
- members of the public – visitors, customers, patients, students, children, elderly
- special groups – young persons, expectant or nursing mothers, workers with a disability, lone workers

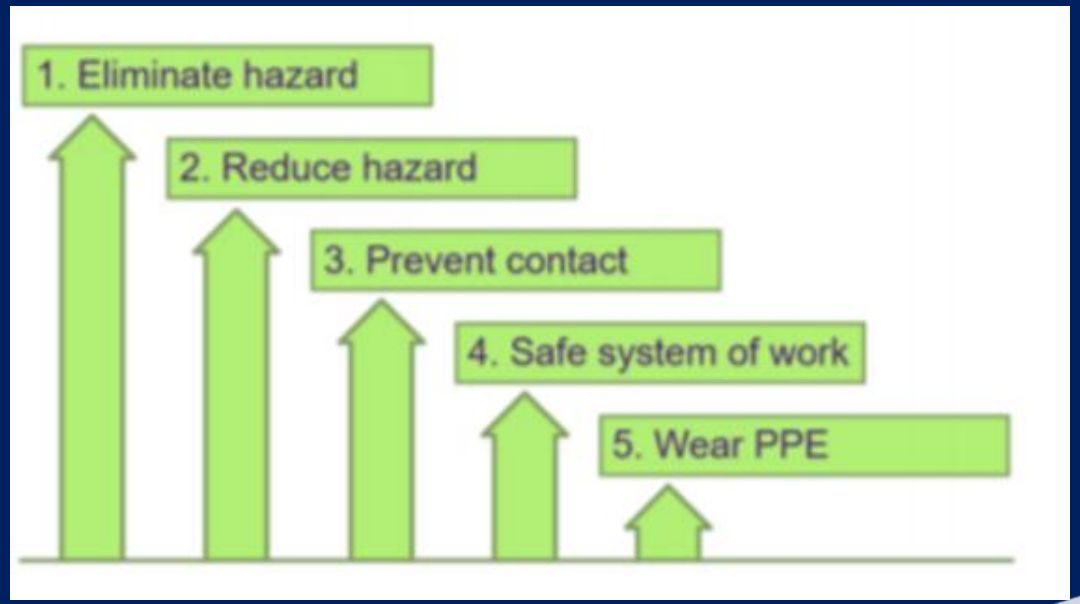
Detail risk controls – Step 3

- the prioritisation of risk control is important
- risks can be reduced at the design stage by using the principles of prevention
- risks can be controlled by using the hierarchy of risk control

Hierarchy of Risk Control

The health and safety management system ISO 45001 hierarchy of risk control is:

1. eliminate the hazard;
2. substitute with less hazardous materials, processes, operations or equipment;
3. use engineering controls;
4. use safety signs, markings and warning devices and administrative controls;
5. use personal protective equipment



Hierarchy of Risk Control- in practice

1. Elimination
2. Substitution
3. Changing work methods/patterns
4. Reduced time exposure
5. Engineering controls (isolation, insulation and ventilation)
6. Good housekeeping
7. Safe systems of work
8. Training and information
9. Personal protective equipment
10. Welfare
11. Monitoring and supervision
12. Review

Signs as an administrative Control

(i) **prohibition sign** – a sign prohibiting behaviour likely to increase or cause danger (eg 'no access for unauthorised persons');

(ii) **warning sign** – a sign giving warning of a hazard or danger (eg 'danger: electricity');

(iii) **mandatory sign** – a sign prescribing specific behaviour (eg 'eye protection must be worn');

(iv) **emergency escape or first-aid sign** – a sign giving information on emergency exits, first aid, or rescue facilities (eg 'emergency exit/escape route';

- Red – prohibition – round (e.g. no smoking)
- Yellow – warning – triangular (e.g. wet floor)
- Blue – mandatory – round (e.g. ear defenders must be worn)
- Green – safe condition – square or rectangular (e.g. first-aid)

Monitor and Review - Step 5

Regular reviews required but need to be more frequent if:

- new legislation introduced
- new information available on substances or process
- changes to the workforce – introduction of trainees
- an accident has occurred.

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When assessing the risks, the following risk rating matrix was used.

Likelihood	Rating
Highly likely	**5**
Likely	**4**
Possible	**3**
Unlikely	**2**
Highly unlikely	**1**

Severity	Rating
Fatality	**5**
Major injury	**4**
Minor injury	**3**
First Aid	**2**
Trivial or no injury	**1**

Severity								
	5	5	10	15	20	25		
	4	4	8	12	16	20	15-25	Unacceptable – **Stop works until the risk has been lowered.**
	3	3	6	9	12	15	8-14	Moderate – **Introduce adequate controls to reduce the risk.**
	2	2	4	6	8	10	4-7	Adequate – **Try to improve if reasonably practicable.**
	1	1	2	3	4	5	1-3	Acceptable – **Ensure controls are maintained.**
		1	2	3	4	5		
		Likelihood						

Final risk ratings and actions:

Record of risk assessment findings- Step 4

Activity	Hazard	Existing Control Measures	Pre Control Risk Ratings			Control Measures	Post Control Risk Ratings			Comments
			L	S	L x S		L	S	L x S	

HSE Box Video

- https://youtu.be/3eCKfBkSUMU

Special cases which require a risk assessment

- SUBSIDIARY LEGISLATION 646.04PROTECTION OF YOUNG PERSONS AT WORKPLACES REGULATION

- SUBSIDIARY LEGISLATION 646.05PROTECTION OF MATERNITY AT WORKPLACES REGULATIONS

Special Cases: Young Persons

A special risk assessment must be made to include details of:

- the work activity;
- any prohibited processes or equipment;
- the health and safety training provided; and
- the supervision arrangements

- are under 18 years
- subject to peer pressure and are inexperienced
- are eager to please
- appropriate level and approach of subject matter in training sessions.

Special Cases: Expectant and nursing mothers

- manual handling;
- chemical and biological agents;
- ionising radiation;
- passive smoking;
- lack of rest room facilities;
- temperature variations;
- prolonged standing or sitting;
- whole-body vibration;
- issues associated with the use and wearing of personal protective equipment;
- working excessive hours;
- night working; and
- stress and violence to staff
- noise

Special Cases: Workers with a disability

- emergency arrangements including ‘raising the alarm’; and
- adequate wheelchair access to fire exit.

The special risk assessment should identify:

- the jobs with particular health and fitness requirements;
- the types of disability that would make certain jobs unsuitable; and
- the staff whose disabilities would exclude them from undertaking those jobs safely

Special Cases: Lone Workers

- special risk assessment (including violence);
- must be fit to work alone;
- special training should be given;
- possible to handle all equipment and substances alone;
- periodic visits by supervisor;
- regular mobile phone contact with base;
- first-aid arrangements;
- and emergency arrangements.

Sources of information to anticipate what possibly go wrong

Internal Sources:

1. accident and ill-health records and investigation reports
2. absentee records
3. inspection and audit reports undertaken by the organisation and by external organisations such as the HSE
4. maintenance, risk assessment (including COSHH) and training records
5. documents which provide information to workers
6. any equipment examination or test reports

Sources of information to anticipate what possibly go wrong

External Sources

1. health and safety legislation
2. HSE publications, such as Approved Codes of Practice, guidance documents, leaflets, journals, books and their website
3. international (e.g. ILO), European and British standards
4. health and safety magazines and journals
5. information published by trade associations, employer organisations and trade unions
6. specialist technical and legal publications
7. information and data from manufacturers and suppliers

General principles of control

- The planning and implementing section of the health and safety management system is based on risk assessment and concerns all the actions taken to control or eliminate hazards and reduce risks. The principles of prevention are used when equipment or processes are being designed or selected. The hierarchy of risk control enables risk to be further controlled

The principles of prevention

- avoid risks
- evaluate risks which cannot be avoided
- adapt work to the individual
- adapt to technical changes
- replace dangerous items with less dangerous items
- develop an overall prevention policy
- give priority to collective measures (Safe Place strategy)
- give instructions to employees (Safe Person strategy).

Employer's duty HEALTH AND SAFETY AT WORK CAP. 646.13

12.(1) It shall be the duty of an employer to ensure the physical and psychological wellbeing of his workers at all times and of all persons ho may be affected by the work being carried out for such employer at their workplace.

2) The measures that shall be taken by an employer to prevent physical and psychological ill-health, injury or death at work, shall be taken on the basis of the following general principles of prevention, that is:

(a) by the avoidance of risk;
(b) by the identification of hazards associated with work;
(c) by the evaluation of those risks which cannot be avoided;
(d) by the control at source of those risks which cannot be avoided;
(e) by taking all the necessary measures to reduce risk and danger as much as reasonably practicable, according to the particular case;

Employer's duty HEALTH AND SAFETY AT WORK CAP. 646.13

f) by giving collective protective measures priority over individual protective measures;
g) by adapting the work to the worker, particularly insofar as the design of workplaces, the choice of work equipment and the choice of working and production methods are concerned, in particular with a view to alleviating monotonous work and work at a predetermined work-rate, and to reducing their effect on health;
h) by adapting to technical progress in the interest of health and safety at work;
i) by the development of a coherent overall prevention policy which covers technology, the organisation of work, working conditions, social relationships and the influence of factors related to the working environment;
j) by replacing the dangerous by the non-dangerous or the less dangerous; and
k) by giving appropriate instructions to worker

(3) Without prejudice to the generality of sub-article (2), it shall be the duty of an employer to provide such information, instruction, training and supervision as is required to ensure health and safety at work

Responsibilities of the Project Supervisor for health and safety 👷

The Project Supervisor is responsible for, amongst others:

✅Ensuring cooperation between all those involved on site.

✅Organising regular and frequent inspections.

✅Maintaining documentation related to assessments, measures and actions implemented in relation to health and safety.

✅Maintaining a plan for health and safety for the entire duration of the project.

✅Ensuring that all health and safety measures are implemented as per legislation.

✅Observing that risk assessment and implementation of controls on sites are adequate and efficient.

✅Investigating reports passed on to him from workers, contractors or third parties.

The Project Supervisor has the authority to halt works if the necessary measures are not implemented 🛑.

Employee's duties: HEALTH AND SAFETY AT WORK CAP. 646.13

15.(1) It shall be the responsibility of each worker to take care as far as possible of his own health and safety and that of other persons affected by his acts or omissions at work in accordance with his training and the instructions given by his employer.

(2) Workers shall in accordance with their training and the instructions given by their employer:

(a) make correct use of machinery, apparatus, tools, dangerous substances, transport equipment and other means of production;

(b) make correct use of the personal protective equipment provided to them and, after use, return it to its proper place;

(c) refrain from disconnecting, changing or removing arbitrarily fitted safety devices, including those fitted to machinery, apparatus, tools, plant and buildings, and use such safety devices correctly; and

(d) immediately inform the employer and, or the workers with specific responsibility for the health and safety of workers of any work situation they have reasonable grounds for considering represents a serious and immediate danger to health and safety and of any shortcomings in the protection arrangements..

Employee's duty HEALTH AND SAFETY AT WORK CAP. 646.13

15.
(3) It shall be the duty for every worker to cooperate with the employer and with the workers' health and safety representative or representatives at work, on all matters relating to health and safety.
(4) A worker shall not engage in any improper conduct or behaviour that is likely to endanger his own health and safety at work or that of any other person.

Development and implementation of safe systems of work

Method statements are formal written safe systems of work and are often used in construction work.

The safe system of work should be based on a thorough analysis of the job or operation to be covered by the system. After the introduction of a safe system of work the following controls are required:

- Engineering or process controls (e.g. guarding)
- Documented procedures
- Behavioural controls requiring a certain standard of behaviour from individuals.

Steps in the development of a safe system of work

- Assess the task (complexity, accident records, etc.)
- Identify the significant hazards associated with the task
- Define safe methods for performing the task (including emergency procedures) – document the methods if required
- Implement the safe system of work (written safe system to be signed off)
- Monitor the safe system of work and review it if necessary
- Train the workforce in safe procedures and enter on training record.

Safe systems of work are particularly important for:

- maintenance work
- contractors
- emergency procedures
- lone working
- vehicle operations
- cleaning operations.

Development and implementation of safe systems of work- Role of Competent Person & Manager

A competent person or safety adviser should:

- assist managers to draw up guidelines for safe systems of work;
- prepare suitable documentation; and
- advise management on the adequacy of the safe systems produced

Role of managers:

- provide safe systems of work;
- ensure that employees are adequately trained in a specific safe system of work and are competent to carry out the work safely; and
- provide sufficient supervision to ensure that the system of work is followed and the work is carried out safely

Development and implementation of safe systems of work

Employee involvement
Includes:

- consultation with those employees who will be exposed to the risks, either directly or through their representatives;
- discussion of the proposed system with those who will have to work under it and supervise it; and
- understanding that employees have a responsibility to follow the safe system of work.

21 ACADEMY

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