Chapter 2

INTRODUCTION TO THE REGULATORY SYSTEM

Engineering Practices

ENPRA101A

Topic 2-1

ELECTRICAL INDUSTRY REGULATORY SYSTEM

ENPRA101A – Engineering Practices

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INTRODUCTION

- Rules governing the electrical industry are concerned with two distinct areas:
  - Rules governing marketing of electrical energy, and
  - Rules governing safety of personnel and property
- Generation and distribution of electricity to consumers is governed by the *Energy Market Act 2004* and its subordinate regulations.

INTRODUCTION

- Knowledge of the regulatory system is essential for designers that may be involved in:
  - Design of building electrical services
  - Preparation of single line diagrams
  - Preparation of design reports for client
  - Preparation of load schedules for distribution boards(DB) and main distribution boards(MDB)
  - Sizing of Mains Sub-mains Electrical risers and final Sub-circuits
  - Cost analysis and estimates
  - Preventative maintenance planning

INTRODUCTION

- Engineers have a professional and legal ‘duty of care’ to design products, processes and systems that are as safe as is reasonably practicable.

LEGAL & REGULATORY FRAMEWORK

- Commonwealth Government has a responsibility to ensure that there is an overall national framework that ensures safety.
- States and Territories have the responsibility for making laws about health and safety and for enforcing those laws.
- Each State and Territory has a principal OH&S Act, which sets out requirements for ensuring that workplaces are safe, and also sets out ‘duty of care’ responsibilities in the workplace.

LEGAL & REGULATORY FRAMEWORK

- Duty of care requires everything 'reasonably practicable' to be done to protect the health and safety of others. This duty is placed on:
  - employers,
  - employees,
  - Contractors
  - Engineers
  - Anyone who designs, manufactures, imports, supplies or installs plant, equipment or materials used in the workplace.

LEGAL & REGULATORY FRAMEWORK

Australian H & S law is governed by a framework of Acts, Regulations and supporting guidance material such as codes of practice and standards

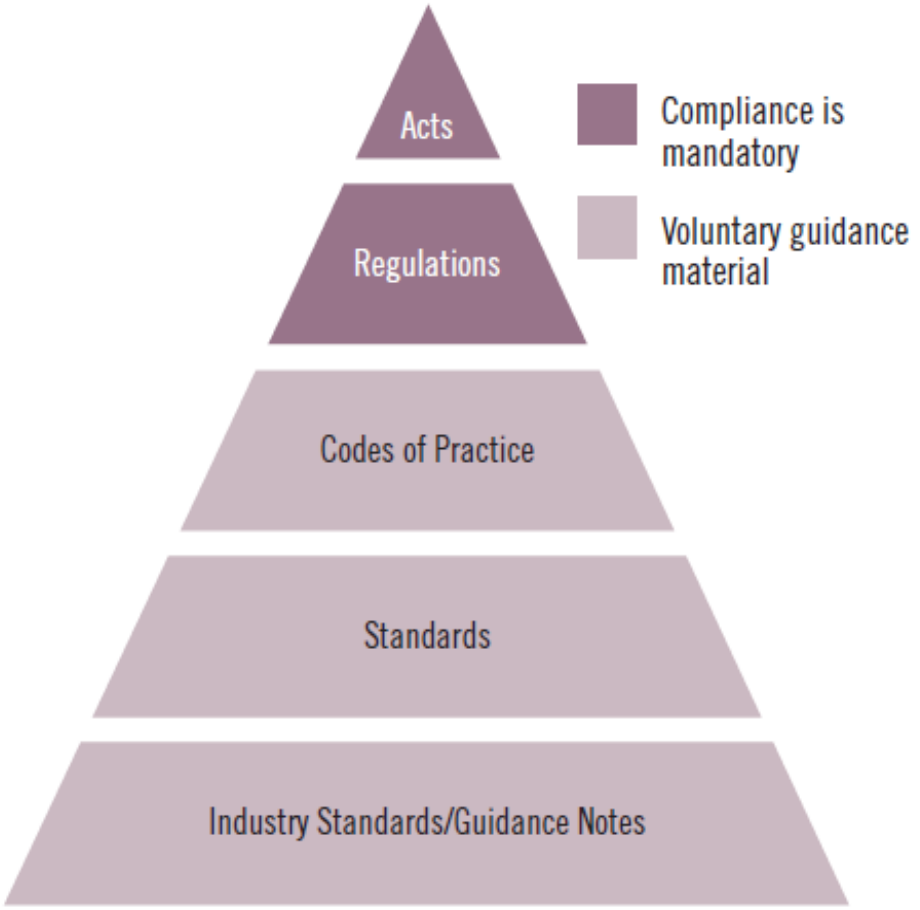

Fig PF-2-1-1 Hierarchy of the Regulatory Framework

ACTS

- An Act or Statute is law made by parliament and enforced by government departments.
- In each jurisdiction there is a principal OH&S Act which gives broad duties to the workplace parties and may include requirements for:
  - promoting OH&S in the workplace;
  - providing safe, risk free systems of work;
  - employers and employees participating in H & S issues through consultation;
  - H & S of the public in relation to work activities.

ACTS

- Not complying with an Act is considered an offence and can result in a fine, or the issuing of either an improvement or prohibition notice.
- Breach of an Act includes exposing personnel to risk.
- The OH&S Acts also specify duties for designers, manufacturers and suppliers.

REGULATIONS

- Regulations support a principal Act by outlining how the general obligations of an Act will be applied in a workplace.
- OH&S regulations offer more detailed requirements for specific areas of workplace H&S (e.g. provisions relating to specific processes and hazards such as spray painting, abrasive blasting, asbestos etc.
- Not complying with a regulation is considered an offence and can result in a fine, issuing of an improvement or prohibition notice or imprisonment.

CODES OF PRACTICE

- Codes of Practice (CoPs) give practical advice and guidance on acceptable ways of complying with the general obligations set out in Acts and Regulations.
- CoPs are issued by Commonwealth, State and Territory governments and are usually designed to be used in addition to the Acts and Regulations, but can also be incorporated into legislation.
- A breach of a code is not by itself a breach of an Act or Regulation.

CODES OF PRACTICE

….Continued….

- CoPs can be used as evidence in court to demonstrate what an employer should have been doing to comply with the obligations under the Act or Regulations to ensure the objective of the Act is achieved.

STANDARDS

- Standards can be developed by relevant governments, employer associations, trade unions and industry bodies.
- In regards to H&S, there are two main sources of standards:
  - **National Standards.**
  - **Australian Standards.**

STANDARDS

National Standards

- Produced by the Australian Compensation and Safety Council in consultation with the State/Territory OH&S authorities, employee unions and employer associations.
- National Standards usually deal with workplace problems such as noise or dangerous working environments.

STANDARDS

National Standards (Cont'd)

- Examples of National Standards:
  - National Standard for Construction Work [N0HSC:1016 (2005)]
  - National Standard for the Storage and Handling of Workplace Dangerous Goods [NOHSC:1015 (2001)]
  - National Standard for Occupational Noise [N0HSC:1007 (2000)]
- National Standards adopted by States and Territories into their OHS legislation become mandatory

STANDARDS

Australian Standards

- Produced by Standards Australia, a non-government organisation that makes standards in consultation with overseas standards bodies (e.g. International Standards Organisation [ISO]) and Australian technical committees.
- Australian Standards provide technical and design guidance. Some standards are directly relevant to health and safety, such as safety and emergency equipment and fire safety standards.

STANDARDS

Australian Standards (Cont'd)

- Examples of Australian Standards:
  - AS/NZS 4304:2001 – OH&S management systems – General guidelines on principles, systems and supporting techniques.
  - AS 4024:1996 - Safeguarding of Machinery.
- Standards are only enforceable by law when they are specifically referenced in a State/Territory health and safety regulation.

GUIDANCE NOTES

- Guidance Notes usually relate to declared national standards and/or CoPs, and provide detailed guidance on specific H&S topics.
- May not be suitable for reference in the various jurisdictional laws.

GUIDANCE NOTES

- Examples of Guidance Notes:
  - Guidance Note on the Membrane Filter Method for Estimating Airborne Asbestos Fibres 2nd Edition [NOHSC:3003 (2005)]
  - Guidance Note: Working Safely with Fork Lifts, Commission for Occupational Safety and Health, Western Australia
  - Guidance Note: Guarding of Machines. Victorian WorkCover Authority
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AS/NZS 3000

- This is the most used publication in the electrical industry
- The current version at the time of writing this workbook was first released in 2007.
- AS/NZS 3000:2007 (also known as the *Wiring Rules*) sets out the minimum requirements for the design, construction and testing of electrical installations, including the selection and installation of electrical equipment forming part of such electrical installations.

AS/NZS 3000

Legislative Link

- In NSW the legislation making the requirements of AS/NZS 3000:2007 mandatory is the *Electricity (Consumer Safety) Act 2004 No 4,* which in Clause 31(1) states in part "*A person must carry out electrical installation work in accordance with such standards or requirements as may be prescribed by the regulations.....*".

AS/NZS 3000

Legislative Link (Cont'd)

- The 'regulations' referred to is the *Electricity (Consumer Safety) Regulation 2006* which among other relevant clauses state in Clause 32(3) *"Electrical installation work is required to be carried out in accordance with the Australian/New Zealand Wiring Rules"* and Clause 32(4) *"An electrical installation, or part of an electrical installation, must not be energised unless its safe operation and compliance with the Australian/New Zealand Wiring Rules have been established by a safety and compliance test."*
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AS/NZS 3000

Structure of AS/NZS 3000:2007

- The *Wiring Rules* are minimum requirements and additional rules of any regulatory authority or energy distributor must be observed.
- AS/NZS 3000:2007 is set out in two parts and eight sections. Part 1 sets the safety and performance standards to which an electrical installation shall comply. Part 2 provides installation practices that achieve certainty of compliance with the standards set out in Part 1.

THE LICENSING OF ELECTRICAL WORKERS IN AUSTRALIA

- Contractors and workers involved in electrical installation must register and/or have a license from the relevant State or Territory electrical registration and licensing authority.
- Licenses are issued in various grades which define the work permitted.
- A separate license is required in each State and Territory.

THE LICENSING OF ELECTRICAL WORKERS IN AUSTRALIA

- There are arrangements for the mutual recognition of interstate licenses which facilitate the issue of similar licenses in different States and Territories.
- In April 2009 the Commonwealth, state and territory governments agreed to introduce a National Occupational Licensing System for a number of specified occupations.
- This new national system will replace the existing state-based licensing requirements.

Topic 2-2

WORKPLACE HEALTH AND SAFETY

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WORKPLACE HEALTH AND SAFETY

Based on:

Code of Practice

"HOW TO MANAGE WORK HEALTH AND SAFETY RISKS"

As issued by

Safe Work Australia

December 2011

Introduction

- The Code of Practice (CoP) *How To Manage Work Health And Safety Risks* is an approved code of practice under section 274 of the *Work Health and Safety Act* (the WHS Act).
- The CoP is a practical guide to achieving the standards of health, safety and welfare required under the WHS Act and the Work Health and Safety Regulations (the WHS Regulations).

Introduction

- A CoP applies to anyone who has a duty of care in the circumstances described in the CoP.
- Like regulations, CoPs deal with particular issues and do not cover all hazards or risks that may arise.
- The health and safety duties require duty holders to consider all risks associated with work, not only those for which regulations and codes of practice exist.
- CoPs are admissible in court proceedings under the WHS Act and Regulations.

Introduction

- Compliance with the WHS Act and Regulations may be achieved by following other methods, such as a technical or an industry standards, if they provide an equivalent or higher standard of WHS than the CoP.
- The CoP is applicable to persons conducting a business or undertaking, including employers, self-employed, principal contractors, persons with management or control of a workplace, designers, manufacturers, importers and suppliers of plant, substances or structures that are used for work.

Responsibility

- The WHS Act and Regulations require persons who have a duty to ensure health and safety to ‘manage risks’ by eliminating health and safety risks so far as is reasonably practicable, and if it is not reasonably practicable to do so, to minimise those risks so far as is reasonably practicable.

Responsibility

- Deciding what is ‘reasonably practicable’ to protect people from harm requires taking into account and weighing up all relevant matters, including:
  - the likelihood of the hazard or risk concerned occurring
  - the degree of harm that might result from the hazard or risk
    - the likelihood of the hazard or risk concerned occurring
    - the degree of harm that might result from the hazard or risk
    - knowledge about the hazard or risk, and ways of eliminating or minimising the risk

Responsibility

continued from previous page ...

- the availability and suitability of ways to eliminate or minimise the risk, and
- whether the cost is grossly disproportionate to the risk (after assessing the risk and available ways of eliminating or minimising it).

Terminology

- **Hazard** - a situation or thing that has the potential to harm a person. Hazards at work may include: noisy machinery, a moving forklift, chemicals, electricity, working at heights, a repetitive job, bullying and violence at the workplace.
- **Risk** - the possibility that harm (death, injury or illness) might occur when exposed to a hazard.

Terminology

- **Risk control -** taking action to eliminate health and safety risks so far as is reasonably practicable, and if that is not possible, minimising the risks so far as is reasonably practicable. Eliminating a hazard will also eliminate any risks associated with that hazard.

Managing Risks

- *Risk management* involves the four steps:
  - **Identify hazards** – find out what could cause harm
  - **Assess risks** – understand the nature of the harm that could be caused by the hazard, how serious it could be and the likelihood of it happening
  - **Control risks** – implement the most effective control measure that is reasonably practicable in the circumstances
  - **Review control measures** - to ensure they are working as planned.

Managing Risks

- The WHS Act requires that:
  - Management and workers consult about matters directly affected by a WHS matter.
  - If the workers are represented by a health and safety representative, the consultation must involve that representative.
  - Management consult, co-operate and co-ordinate activities with all other persons who have a WHS duty in relation to the same matter.

Managing Risks

- Sometimes responsibility for a health and safety matter are shared with other business operators who are involved in the same activities or who share the same workplace.
- When entering into contracts, safety requirements and policies should be communicated to all stakeholders
- Managing WHS risks is an ongoing process that is triggered when any changes affect work activities. Risk management steps should be revisited when:

Managing Risks

- starting a new business or purchasing a business
- changing work practices, procedures or the work environment
- purchasing new or used equipment or using new substances
- planning to improve productivity or reduce costs
- new information about workplace risks becomes available
- responding to workplace incidents
- responding to concerns raised by workers, health and safety representatives or others
- required by the WHS regulations for specific hazards

Finding Hazards In The Workplace

- Identifying situations that could potentially cause harm to people. Hazards generally arise from the following aspects of work:
  - physical work environment
  - equipment, materials and substances used
  - work tasks and how they are performed
  - work design and management
- Table 1 on the next page lists some common types of workplace hazards.

TABLE 1. EXAMPLES OF COMMON HAZARDS

HAZARD	POTENTIAL HARM
Manual tasks	Overexertion or repetitive movement can cause muscular strain
Gravity	Falling objects, falls, slips and trips of people can cause fractures, bruises, lacerations, dislocations, concussion, permanent injuries or death
Electricity	Potential ignition source. Exposure to live electrical wires can cause shock, burns or death from electrocution
Machinery and equipment	Being hit by moving vehicles, or being caught by moving parts of machinery can cause fractures, bruises, lacerations, dislocations, permanent injuries or death
Hazardous chemicals	Chemicals (such as acids, hydrocarbons, heavy metals) and dusts (such as asbestos and silica) can cause respiratory illnesses, cancers or dermatitis
Extreme temperatures	Heat can cause burns, heat stroke or fatigue Cold can cause hypothermia or frost bite
Noise	Exposure to loud noise can cause permanent hearing damage
Radiation	Ultra violet, welding arc flashes, micro waves and lasers can cause burns, cancer or blindness
Biological	Micro-organisms can cause hepatitis, legionnaires' disease, Q fever, HIV/AIDS or allergies
Psychosocial hazards	Effects of work-related stress, bullying, violence and work-related fatigue
Manual tasks	Overexertion or repetitive movement can cause muscular strain

Finding Hazards In The Workplace

1. Inspect the workplace :
   - how people actually work
   - how plant and equipment is used
   - what chemicals are around
   - unsafe work practices
   - Adequate space, lighting, ventilation
   - Suitable tools and equipment for the task
   - Workplace culture – stress, bullying, fatigue,

Finding Hazards In The Workplace

2. Consult workers
   - Inquiries or surveys about any health and safety problems
3. Review available information from
   - regulators,
   - industry associations,
   - unions,
   - technical specialists and
   - safety consultants.
   - Manufacturers and suppliers
   - Workplace records – ie incident reports, etc.

When to Assess Risks

- A risk assessment involves considering what could happen if someone is exposed to a hazard and the likelihood of it happening.
- A properly conducted risk assessment can help determine:
  - how severe a risk is
  - whether any existing control measures are effective
  - what action should be taken to control the risk
  - how urgently the action needs to be taken.

When to Assess Risks

- **A risk assessment should be carried out:**
  - When there is uncertainty about how a hazard may result in injury or illness
  - When a work activity involves a number of different hazards and there is a lack of understanding about how the hazards may interact with each other to produce new or greater risks
  - When changes at the workplace occur that may impact on the effectiveness of control measures.

When to Assess Risks

- A risk assessment is mandatory under the WHS Regulations for high risk activities such as entry into confined spaces, diving work and live electrical work.
- Some hazards that have exposure standards, such as noise and airborne contaminants, may require scientific testing or measurement by a competent person to accurately assess the risk

When to Assess Risks

- **A risk assessment is not necessary in the following situations:**
  - Where legislation requires some hazards or risks to be controlled in a specific way.
  - Where a code of practice or other guidance sets out a way of controlling a hazard or risk.
  - Where there are well-known and effective controls that are in use in the particular industry

How to Assess Risks

- All hazards have the potential to cause different types and severities of harm, ranging from minor discomfort to a serious injury or death.

The 3 steps in assessing risk are summarised below and detailed in the following pages

1. Determine severity of consequence of the identified hazard
2. Determine Probability of consequence occurring
3. Determine risk level (from 1 and 2)

How to Assess Risks

1. **Determine severity of consequence (Consider what type of harm could occur**)
   - Ranges from minor injuries requiring first aid to injuries incurring lost time, permanent injuries, injury due to long time exposure to hazards, psychological injury and death
   - Consider how many people are exposed
   - Consider if one failure could lead to other failures? e.g. Power failure could make some control measures that rely on electricity ineffective

How to Assess Risks

2. Determine Probability (of consequence or harm occurring)

- Consider how often is the task done? Does this make the harm more or less likely?
- How often are people near the hazard? How close do people get to it?
- Has it ever happened before? How often?
- Table 2 in CoP ***How To Manage Work Health And Safety Risks*** contains further questions that can help in estimate likelihood.

How to Assess Risks

2. **Determine Probability** (cont'd)

- There are many ways of ranking likelihood, one method is as follows:
  - Certain to occur - expected to occur in most circumstances
  - Very likely - will probably occur in most circumstances
  - Possible – might occur occasionally
  - Unlikely – could happen at some time
  - Rare – may happen only in exceptional circumstances

How to Assess Risks

- The level of risk will increase as the likelihood of harm and its severity increases.
- Many risk assessment methods use a ‘risk matrix’ approach – An example of such a method follows:

Example of *Risk Matrix* Approach to Risk Assessment

1. Identify Risk
2. Determine likelihood to cause harm from the following table

RISK LIKELIHOOD	
Likelihood	**Description**
5 - Almost Certain	Expected to occur in most circumstances
4 - Likely	Probably will occur in most circumstances
3 - Possible	Might happen at some time
2 - Unlikely	Could happen, but rarely
1 - Rare	Has never occurred before

Example of *Risk Matrix* Approach to Risk Assessment

3. Determine potential consequence from the following table

RISK CONSEQUENCE	
Consequence	**Description**
5 - Catastrophic	Multiple fatalities; irreversible effects; Property loss $10-100M; Extensive Environmental damage.
4 - Major	Fatality; Serious irreversible disabilities; Property loss $1-10M; Medium term Environmental damage
3 - Moderate	Moderate irreversible disability; Property loss $100K-1M; Moderate environmental damage;
2 - Minor	Minor injuries & hospitalisations; Property loss $10-100K; Short term Environmental damage
1 - Insignificant	No medical treatment; Property loss <$10K; No Environmental damage

Example of *Risk Matrix* Approach to Risk Assessment

4. Determine the risk level from Risk Assessment Matrix below

	RISK ASSESSMENT MATRIX					
	Likelihood					
Consequence		Rare	Unlikely	Possibly	Likely	Almost Certain
	Catastrophic	Medium	High	Critical	Critical	Critical
	Major	Low	Medium	High	Critical	Critical
	Medium	Low	Low	Medium	High	Critical
	Minor	Very Low	Low	Low	Medium	High
	Insignificant	Very Low	Very Low	Low	Low	Medium

Example Ex-1-2-1

You have just passed your driving test and on the first drive to the City, you are driving up a hill and hit the central kerb with the driver side front wheel. You hear a bang and then feel vibration in the steering wheel. You stop the car and get out to have a look. You have a flat tyre.

Luckily you have a spare tyre and a jack in the boot. As it is dark, you are on a hill and you have never changed a tyre on a car before, you decide to do a risk assessment.

Identify all hazards that you can and use the 'Risk Matrix' method to determine a subjective consequence, probability and risk for each hazard.

Solution to Ex-1-2-1

- The best way to approach this problem is to identify each hazard, assess its consequence, probability and risk from the previous tables and then summarise these results in a 'Risk Register' table. For example one hazard might be ***Car rolls when wheel is lifted***. With the car facing up-hill this is almost certain to happen so the likelihood is ***5-Almost Certain***. The consequence is assessed as ***3-Moderate*** as the car could cause permanent injury if it rolls over you or someone nearby. The Risk is then taken from the table as ***Critical***.
- Other hazards are identified and analysed and the 'Risk Register' table is populated.

Solution to Ex-1-2-1

HAZARD	CONSEQUENCE	CONSEQUENCE RATING	LIKELIHOOD	RISK LEVEL
Car rolls when wheel is lifted	Damage to Vehicle and person	3 - Moderate	5 – Almost Certain	Critical
Jack Slips	Damage to Vehicle and person	3 - Moderate	5 – Almost Certain	Critical
Fingers trapped against bodywork as nut loosens rapidly	Damage to person	2 - Minor	2 - Unlikely	Low
Back hurt whilst lifting spare out of boot	Damage to person	3 - Moderate	3 - Possible	Medium
Oncoming vehicle runs into back of car with flat tyre	Catastrophic to vehicle and person	4 - Major	1 - Rare	Low

Managing Risk

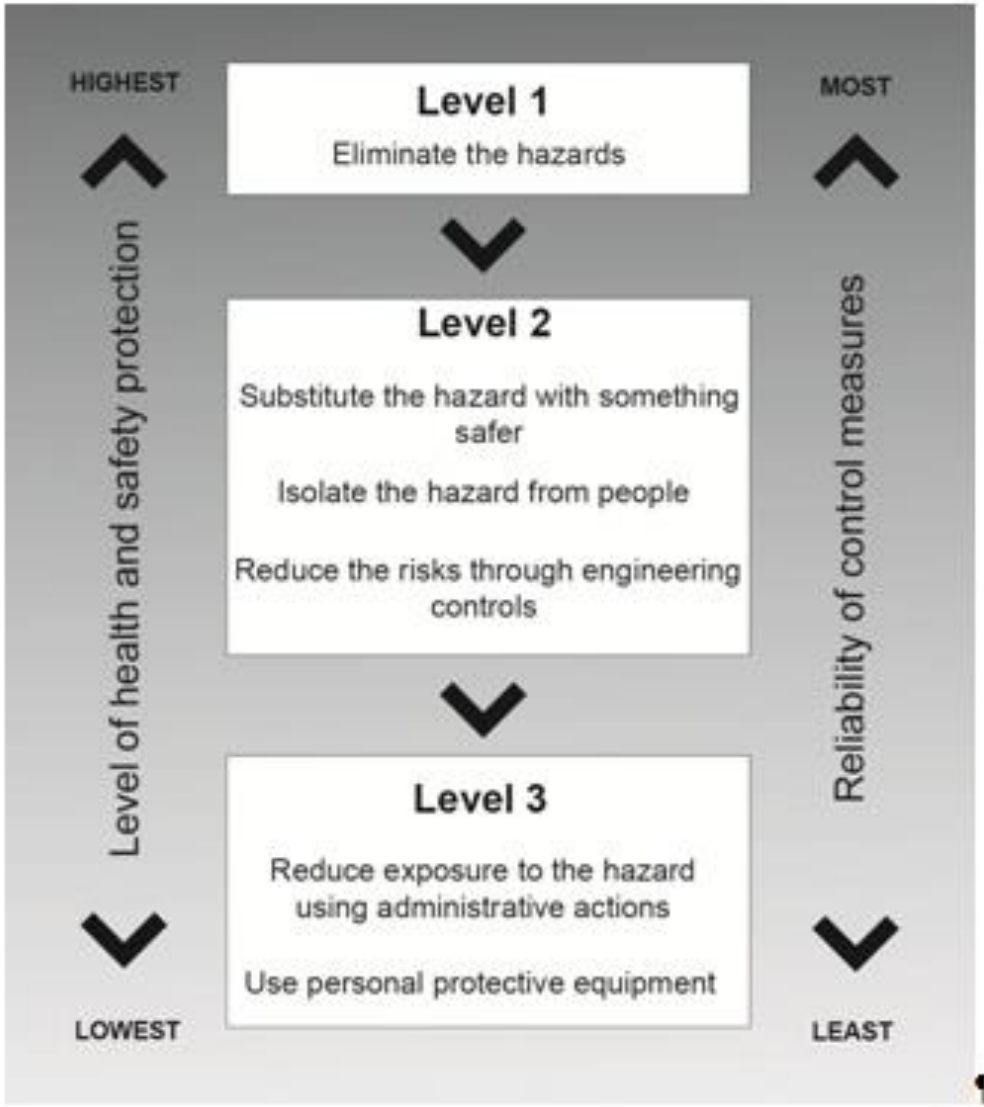
- The best way of managing risk is to eliminate the hazard which poses the risk
- This is not always possible so risks need to be minimised so far as is reasonably practicable.
- The decision on how to control risks must be made in consultation with all stakeholders who will be directly affected by this decision.

The Hierarchy Of Risk Control

- The ways of controlling risks are ranked from the highest level of protection and reliability to the lowest as shown in the following diagram. This ranking is known as the hierarchy of risk control. The WHS Regulations require duty holders to work through this hierarchy when managing risk under the WHS Regulations.

CONTROLLING RISK

The Hierarchy Of Risk Control



The Hierarchy Of Risk Control

Level 1 Control Measures

- Eliminate the hazard by:
  - Design the hazard out of the system in the original design
  - Remove the hazard completely , e.g. removing trip hazards from the factory floor

The Hierarchy Of Risk Control

Level 2 Control Measures

- If it is not reasonably practical to eliminate hazards then risks can be minimised by:
  - Substitute the hazard-with something safer, e.g. replace solvent based paints with water-based ones.
  - Isolate the hazard from people, e.g. guard rails
  - Use engineering controls, e.g. emergency stop switches, mechanical devices to lift heavy objects

The Hierarchy Of Risk Control

Level 3 Control Measures

- These control measures do not control the hazard at the source but rely on human behaviour and supervision
  - Use of administrative controls, e.g. develop procedures on how to operate machinery safely
  - Use personal protective equipment (PPE), e.g. ear muffs, respirators, face masks, hard hats, gloves, aprons and protective eyewear

The Hierarchy Of Risk Control

- Administrative controls and PPE should only be used:
  - when there are no other practical control measures available
  - as an interim measure until a more effective way of controlling the risk can be used.
  - To supplement higher level control measures
- NOTE: Regulation 44-47 of the WHS regulation stipulates requirements for PPE

Remediation Actions

Continuing on from the "Example of *Risk Matrix* Approach to Risk Assessment":-

- Once the risk levels have been determined from the risk matrix, the following remediation actions are required: (next page)

RISK LEVEL MATRIX	
Risk Level	**Required Action**
Critical	**Action required immediately**. The proposed task or process activity must not proceed. Steps must be taken to lower the risk level to as low as reasonably practicable using the Hierarchy of Control.
High	**Action required today.** The proposed activity can only proceed, provided that: • the risk level has been reduced to as low as reasonably practicable using the hierarchy of risk controls • the risk controls include those identified in legislation, Australian Standards, Codes of Practice etc • the risk assessment has been reviewed and approved by the Supervisor, and a Safe Working Procedure or Safe Work Method has been prepared • the supervisor reviews and documents the effectiveness of the implemented risk controls
Medium	**Action required this week** The proposed task or process can proceed, provided that • the risk level has been reduced to as low as reasonably practicable using the hierarchy of risk controls • the risk assessment has been reviewed and approved by the Supervisor, and • a Sate Working Procedure or Sate Work Method has been prepared
Low/Very Low	**Action required this month**. Managed by local documented procedures which must include application of the hierarchy of controls.

Implementing Control Options

- Information regarding controls for many common hazards and risks can be obtained from
  - codes of practice and guidance material
  - Manufacturers and suppliers of plant and material used in the workplace
  - Industry associations and unions

Developing Control Options

- The control option chosen should be:
  - one that provides the highest level of protection and is the most reliable – i.e. controls located towards the top of the hierarchy of risk control.
  - available – i.e. can be purchased, made to suit or be put in place.
  - suitable for the particular workplace

Implementing Controls

- Risk control measures put into operation usually need to be supported by way of:
  - *Work procedures* that describes the task, identify hazards and document how the task is to be performed to minimise the risks.
  - *Training, instruction and information* in the task enable workers to perform the task safely.
  - *Supervision* - The level of supervision required will depend on the level of risk.

Ensuring Control Measures Remain Effective

- The following actions may be used to monitor control measures:
  - *Accountability for health and safety*
  - *Maintenance of plant and equipment*
  - *Up-to-date training and competency*
  - *Up-to-date hazard information*
  - *Regular review and consultation*

WHS Regulation Requirements to Review Risk Control Measures

- A review is required:
  - when the control measure is not effective in controlling the risk
  - before a change at the workplace that is likely to give rise to a new or different health and safety risk that the control measure may not effectively control
  - if a new hazard or risk is identified
  - if the results of consultation indicate that a review is necessary
  - if a health and safety representative requests a review.

WHS Regulation Requirements to Keep Records of Risk Management

- Records may consist of information on:
  - identified hazards, assessed risks, and control measures
  - how and when the control measures were implemented, monitored and reviewed
  - who was consulted
  - relevant training records
  - any plans for changes.

Topic 2-3

ENGINEERS CODE OF ETHICS

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What is a Code of Ethics?

- A code of ethics is a set of guidelines designed to set out acceptable behaviours for members of a particular group, association, or profession.
- Many organizations govern themselves with such a code, especially when they handle sensitive issues like investments, health care, or interactions with other cultures.
- Thus a code of ethics:
  - Sets a professional standard
  - Improves public perception of the particular profession

Engineers Australia

- In Australia the organisation known as the *The Institution of Engineers Australia* or IEAust is the de facto custodian of the Engineers Code of Ethics
- IEAust trading as Engineers Australia, is a professional body and not-for-profit organisation dedicated to being the national forum for the advancement of the engineering field within Australia.
- It has over 85.000 members from all engineering disciplines.

Engineers Australia

- IEAust was first established in 1919 when representatives of twelve separate engineering societies met in Sydney and joined to form the Institution of Engineers.
- IEAust was formed with the intention of establishing a national organisation to represent the various disciplines of engineering
- The Institution established standards of entry to the profession.

Engineers Australia

- The Institution of Engineers, Australia was granted a Royal Charter in 1938 and now operates within the terms of the Supplemental Royal Charter and By-laws granted in 2006.
- In March 2003 it adopted a new common name Engineers Australia.
- The Institution established a Code of Ethics, issued codes of standards for professional practice and charges for consulting engineers

Engineers Australia

- It was involved in the accreditation of tertiary undergraduate courses.
- It has been responsible for upgrading educational requirements for engineers.

Engineering Ethics

- The Engineers Australia Code of Ethics published under the title of “Our Code of Ethics” is freely available via the Engineers Australia Website and is condensed in the following pages:

Engineering Ethics

In the course of engineering practice engineering practitioners will:

1. DEMONSTRATE INTEGRITY

1.1 **Act on the basis of a well-informed conscience**

a) be discerning and do what you think is right

b) act impartially and objectively

c) act appropriately, and in a professional manner, when you perceive something to be wrong

Engineering Ethics

d) give due weight to all legal, contractual and employment obligations

1.2 Be honest and trustworthy

a) accept, as well as give, honest and fair criticism

b) be prepared to explain your work and reasoning

c) give proper credit to those to whom proper credit is due

d) in managing perceived conflicts of interest, ensure that those conflicts are disclosed to relevant parties

Engineering Ethics

e) respect confidentiality obligations, express or implied

f) do not engage in fraudulent, corrupt, or criminal conduct

1.3 Respect the dignity of all persons

a) treat others with courtesy and without discrimination or harassment

b) apply knowledge and skills without bias in respect of race, religion, gender, age, sexual orientation, marital or family status, national origin, or mental or physical handicaps

Engineering Ethics

2. PRACTISE COMPETENTLY

2.1 Maintain and develop knowledge and skills

a) continue to develop relevant knowledge and expertise

b) act in a careful and diligent manner

c) seek peer review

d) support the ongoing development of others

2.2 Represent areas of competence objectively

a) practise within areas of competence

Engineering Ethics

b) neither falsify nor misrepresent qualifications, grades of membership, experience or prior responsibilities

2.3 Act on the basis of adequate knowledge

a) practise in accordance with legal and statutory requirements, and with the commonly accepted standards of the day

b) inform employers or clients if a task requires qualifications and experience outside your areas of competence

Engineering Ethics

3. EXERCISE LEADERSHIP

3.1 Uphold the reputation and trustworthiness of the practice of engineering

a) advocate and support the extension of ethical practice

b) engage responsibly in public debate and deliberation

3.2 Support and encourage diversity

a) select, and provide opportunities for, all engineering practitioners on the basis of merit

Engineering Ethics

b) promote diversity in engineering leadership

3.3 Communicate honestly and effectively, taking into account the reliance of others on engineering expertise

a) provide clear and timely communications on issues such as engineering services, costs, outcomes and risks

4. PROMOTE SUSTAINABILITY

4.1 Engage responsibly with the community and other stakeholders

Engineering Ethics

a) be sensitive to public concerns

b) inform employers or clients of the likely consequences of proposed activities on the community and the environment

c) promote the involvement of all stakeholders and the community in decisions and processes that may impact upon them and the environment

4.2 Practise engineering to foster the health, safety and wellbeing of the community and the environment

Engineering Ethics

a) incorporate social, cultural, health, safety, environmental and economic considerations into the engineering task

4.3 Balance the needs of the present with the needs of future generations

a) in identifying sustainable outcomes consider all options in terms of their economic, environmental and social consequences

b) aim to deliver outcomes that do not compromise the ability of future life to enjoy the same or better environment, health, wellbeing and safety as currently enjoyed

The Tenets of the Code of Ethics

The foregoing principles are encapsulated within and established by the Tenets of the Code of Ethics as follows:

1. Members shall place their responsibility for the welfare, health and safety of the community before their responsibility to sectional or private interests, or to other members;
2. Members shall act with honour, integrity and dignity in order to merit the trust of the community and the profession;
3. Members shall act only in areas of their competence and in a careful and diligent manner;

The Tenets of the Code of Ethics

4. Members shall act with honesty, good faith and equity and without discrimination towards all in the community;
5. Members shall apply their skill and knowledge in the interest of their employer or client for whom they shall act with integrity without compromising any other obligation to these Tenets;
6. Members shall, where relevant, take reasonable steps to inform themselves, their clients and employers, of the social, environmental, economic and other possible consequences which may arise from their actions;

The Tenets of the Code of Ethics

7. Members shall express opinions, make statements or give evidence with fairness and honesty and only on the basis of adequate knowledge;
8. Members shall continue to develop relevant knowledge, skill and expertise throughout their careers and shall actively assist and encourage those with whom they are associated, to do likewise;
9. Members shall not assist in or induce a breach of these Tenets and shall support those who seek to uphold them if called upon or in a position to do so.


END