

Unit 6: Health, Safety and Risk Assessment in Engineering

Unit code: A/601/1463

QCF level: 4

Credit value: 15

- **Aim**

This unit aims to provide learners with an understanding of health and safety planning, implementation and legislation within an engineering environment.

- **Unit abstract**

This unit has been designed to develop the learner's awareness of the principles, planning and implementation of health and safety practice within an industrial environment such as those to be found in engineering production, manufacture, services and maintenance and those in the chemical, transport and telecommunication engineering industries.

In particular, the selection, application and evaluation of safe working procedures, for operations appropriate to particular industrial activities, are first considered. Then current UK and EU health and safety legislation, the role of the inspectorate, safety audits and current codes of practice are covered. Next, risk is assessed and evaluated by identifying, rating and assessing the severity of hazards and recording all evidence and actions taken for future monitoring of these hazards. Finally, risk management activities are considered including the methods used for gathering evidence, disseminating information, complying with current regulations and implementing policy to minimise risk to life and property, for activities within a general engineering environment.

- **Learning outcomes**

On successful completion of this unit a learner will:

- 1 Be able to select and apply safe working procedures to engineering operations
- 2 Understand the nature and use of current health and safety legislation
- 3 Be able to analyse engineering activities for the assessment of risk
- 4 Be able to manage and minimise risk to life, property and engineering activities within an industrial environment.

Unit content

1 Be able to select and apply safe working procedures to engineering operations

Protective clothing and equipment: selection and justification of protective clothing for given/chosen environments eg for chemical, temperature, crush resistance, noise protection, visor, goggle usage, electrical isolation, radioactive protection

Permit-to-work: evaluation of a range of permit-to-work systems; health and safety executive (HSE) guidance notes; hot-cold entry; buddy and plant identification systems; isolation requirements for given/chosen applications

Isolations: eg lock, multi-lock, blank off, removal, electrical, peg removal, linked valve key, isolation valves

Monitoring equipment: use of monitoring equipment to ensure/determine safe working environment eg noise, dust, fumes, temperature, movement, radiation; cost and usability

2 Understand the nature and use of current health and safety legislation

Current regulations: relevant and current UK and EU regulations eg COSHH, noise at work, pressure systems, manual handling, personal protective equipment, control of asbestos, Health and Safety at Work Act, management of health and safety at work, IEE wiring regulations, EMC directive; for typical engineering operations eg engineering production and manufacture, engineering services, materials handling, telecommunications and transportation

Role of HSE Inspectorate: span of authority; right of inspection; guidance notes and booklets

Safety audits: policies; record keeping; safety surveys; training; proformas; management commitment; planning and implementation

Codes of practice: use of applying technology for codes and regulations; awareness of relevant codes of practice eg HSE guidance, Occupational Exposure Standards

3 Be able to analyse engineering activities for the assessment of risk

Hazard: identification of potential hazards eg fire, noise, temperature, field of vision, fumes, moving parts, lighting, access, pressure, falling bodies, airborne debris, radiation and chemical hazards

Risk rating: matrix production eg low risk, moderate risk, substantial risk, high risk

Frequency and severity: evaluation of the rate of occurrence eg improbable, possible, occasional, frequent, regular, common; evaluation of severity eg definitions of consequence; level of injury eg graded (trivial, minor, major, multiple major, death, multiple death)

Record: production of proforma for each hazard, types of recording systems; employee training and company awareness; analysis of a system

4 **Be able to manage and minimise risk to life, property and engineering activities within an industrial environment**

Evidence: evaluation of evidence to support the likelihood of or reoccurrence of a risk; use of statistical data eg fatigue charts, working hours, temperature, lighting levels, noise, incorrect procedures, working practices, time of day

Implications: analysis and evaluation of the implications of the risk eg threat to life, injuries, property, environment, need to redesign, effect on company, effect on other companies; mandatory factory closure

Information: obtaining and use of data about the risk to others eg data sheets on substances, factory rules, codes of practice; safe working procedures, hazard identification eg hard hat area; training procedures for new staff and contractors

Minimising risk: how best to minimise risk eg control of known risks, guarding, covering, screening, encasing, design-out, disaster contingency planning

Implementation: identification of effective methods of control eg management policy, lines of communication, responsibility, safety committees and trade union input

Compliance: identification of the levels of knowledge of regulations and guidelines; mandatory compliance with current and relevant regulations eg Health and Safety at Work Act, Deposit of Poisonous Waste Act, EMC directive; working towards company risk assessment findings

Learning outcomes and assessment criteria

Learning outcomes On successful completion of this unit a learner will:	Assessment criteria for pass The learner can:
LO1 Be able to select and apply safe working procedures to engineering operations	1.1 select and justify choice of protective clothing and equipment to ensure personal protection in a given environment 1.2 evaluate a range of permit-to-work systems and identify isolation requirements for given applications 1.3 use monitoring equipment to ensure the promotion of a safe working environment
LO2 Understand the nature and use of current health and safety legislation	2.1 identify industrial work areas where current regulations would apply and describe the role of the HSE inspectorate 2.2 implement a schedule for the setting-up of a safety audit system 2.3 select the relevant codes of practice to enhance safety
LO3 Be able to analyse engineering activities for the assessment of risk	3.1 identify a hazard and produce a risk rating 3.2 evaluate frequency and severity of an identified hazard 3.3 produce a hazard proforma for a given application 3.4 analyse a recording system that tracks and highlights potential hazards
LO4 Be able to manage and minimise risk to life, property and engineering activities within an industrial environment	4.1 evaluate evidence that would specify the existence of a risk or risks 4.2 analyse the implications of the risk and the effect on life, property and activities 4.3 obtain and use accurate information on the risk for the protection of others 4.4 produce a report on how best to minimise the risk to people, property and activities and recommend effective methods of implementation and control 4.5 identify routes and methods of implementation within a company to ensure that compliance with codes of practice and regulations pertaining to the risk are fully understood.

Guidance

Links

This unit may be linked with any unit that involves aspects of workplace practice and applications. If a holistic approach to the delivery of this unit is adopted, then its successful completion would enable learners to meet the Engineering Technician (Eng Tech) and Incorporated Engineer (IEng) requirements laid down in the UK Engineering Council Standard for Professional Engineering Competence (UK-SPEC) competence E2, 'manage and apply safe systems of work'.

The unit can also be linked to the SEMTA National Occupational Standards in Engineering Management, particularly Unit 1: Develop and Maintain a Healthy and Safe Work Environment.

Essential requirements

Tutors delivering this unit will need to have an in-depth understanding of the health and safety management issues, legislation, procedures and documentation associated with their particular engineering industry.

Learners will need access to a real or realistic simulated environment, directly related to their engineering industry.

Employer engagement and vocational contexts

Liaison with employers can help provide suitable engineering environments. Visits to the learner's workplace or other appropriate industrial facilities, will help foster employer cooperation and help set the focus for the delivery and assessment that have relevance and are of benefit to the whole cohort.