

Unit 1: Working Safely in Engineering

Unit reference number: T/600/9131

QCF level: 1

Credit value: 3

Guided learning hours: 30

Unit aim

This unit is designed to introduce learners to health and safety issues in engineering. It will help them to be aware of the potential hazards they may be exposed to in engineering environments and cope with and reduce risks. This unit provides some of the knowledge, understanding and skills for the Level 1 Performing Engineering Operations NOS Unit 1: Working Safely in an Engineering Environment.

Unit introduction

This unit introduces learners to the health and safety issues associated with developing practical skills in an engineering environment.

Learners will carry out work activities in accordance with instructions and use safe working practices and procedures. They will cover the identification of hazardous situations, equipment, materials or conditions and how to take appropriate action to eliminate/minimise the risks to life, property and the environment within the immediate work surroundings. They will need to recognise the hazards in the engineering environment they work in, appreciate the level of risk involved with those hazards and the precautions they can take to lower the risk of injury or damage to plant and equipment.

Learners will need to demonstrate that they can take actions required in emergency situations such as accidents involving injury and the sounding of fire/evacuation alarms.

Essential resources

Learners will need access to workshops and other facilities to consider health and safety issues.

A range of health and safety policies and procedures from local companies.

A range of legislation and health and safety regulations including:

- Health and Safety at Work etc Act 1974
- Management of Health and Safety at Work Regulations 1999
- Provision and Use of Work Equipment Regulations (PUWER) 1998
- Control of Substances Hazardous to Health (COSHH) Regulations 2002

- Reporting of Injuries, Diseases and Dangerous Occurrences Regulations (RIDDOR) 1995

Videos/DVDs

- *957 Safety and the Human Factor*
- *966 Safety Awareness*
- *994 Personal Protective Equipment*
- *999 Manual Handling*
- *1005 Electrical Safety in the Workplace*
- *COSHH.*
- *Dealing with Chemical Safety*
- *Noise and Hearing Conservation*
- *Risk Assessment*

All available from:

Safetycare (UK) Ltd
1st Floor Greencoat House
183 Clarence Street
Kingston upon Thames
Surrey
KT1 1QT

Learning outcomes, assessment criteria and unit amplification

To pass this unit, the learner needs to demonstrate that they can meet all the learning outcomes for the unit. The assessment criteria determine the standard required to achieve the unit.

Learning outcomes		Assessment criteria	Unit amplification
1	Know about statutory regulations and organisational requirements	1.1	List three general regulations and two specific regulations that have a statutory requirement under relevant sections of the Health and Safety at Work Act 1974
		1.2	List organisational general practices and procedures relevant to an engineering environment
		1.3	Identify the seven warning signs for substances that are harmful
		1.4	Describe when appropriate sources of information would assist compliance with statutory regulations and organisational requirements
			<ul style="list-style-type: none"> □ <i>Statutory regulations:</i> relevant sections of the Health and Safety at Work etc. Act 1974; general regulations eg Control of Substances Hazardous to Health 2002, Reporting of Injuries, Diseases and Dangerous Occurrences Regulations 1995, Provision and Use of Work Equipment Regulations 1998, Management of Health and Safety Regulations 1999; specific regulations eg Abrasive Wheel Regulations, Electricity Regulations, Woodworking Regulations □ <i>Organisational requirements:</i> general practices and procedures of the organisation eg safety policies, codes of practice, safe working practices; □ <i>Warning signs</i> eg for substances that are harmful, highly flammable, corrosive, toxic, explosive, irritant, oxidising, radioactive □ <i>Sources of information:</i> officials eg safety officers, safety representatives, health and safety inspectors; source of health and safety literature eg on noticeboards, safety surveys; the seven main groups of hazardous substances defined by Classification, Packaging and Labelling of Dangerous Substances Regulations

Learning outcomes	Assessment criteria		Unit amplification
2 Know about accident and emergency procedures	2.1	Describe the correct procedure for a given accident involving injury to self or others	<ul style="list-style-type: none"> □ <i>Procedures for accidents:</i> procedures for receiving first aid treatment; who the qualified first aid person is in the work area and where they can be found; the location of first aid facilities eg first aid box, first aid treatment rooms; the accident reporting and recording procedures to be followed; how to deal with victims of electric shock
	2.2	Describe the correct procedure when an emergency alarm is sounded	<ul style="list-style-type: none"> □ <i>Emergency procedures:</i> emergency procedures with regard to fire and premise evacuation; what the emergency alarms sound like; where the alarm buttons are sited in the work area; where the escape routes are and where personnel should assemble after leaving the premises eg fire assembly point; the location and use of the various fire extinguishing equipment and the organisational policy regarding its use
3 Know about controlling hazards in the engineering workplace	3.1	Identify hazards in the engineering workshop	<ul style="list-style-type: none"> □ <i>Identify hazards:</i> the use of hazard checklists; types of hazards eg hazards associated with moving parts of machinery, electricity, slippery and uneven surfaces, dust and fumes, handling and transporting, contaminants and irritants, material ejection, fire, working at height, environment, pressure/stored energy systems, volatile or toxic materials, unshielded processes
	3.2	Identify the control measures to be used to minimise risk for a given engineering environment	<ul style="list-style-type: none"> □ <i>Control measures:</i> eg isolation of the hazard, stopping working activities, lock off and permit to work/entry procedures, provision of safe access and egress, use of guards and fume extraction equipment, use of personal protective equipment □ <i>Engineering environment:</i> typical engineering environment where hazards will be present eg the use of tools, materials and equipment, movement of oil and chemicals, lifting equipment, noisy environment, dealing with electrical or mechanical parts

Learning outcomes	Assessment criteria		Unit amplification
4	4.1	Prepare yourself ready to carry out an activity in the engineering workshop	<ul style="list-style-type: none"> □ <i>Preparation for an engineering activity:</i> preparation eg wearing protective clothing, checking that this fits correctly and is free from loose or torn material, removal of ties, rings, jewellery and neck chains, wearing of safety equipment as required by the work activities; health and hygiene eg skin care (such as barrier creams and gloves); respiratory matters (such as fume extraction, face masks, breathing apparatus); eyesight protection (such as safety glasses, goggles, full face masks); hearing protection (such as ear plugs, ear defenders); head protection (such as caps with hair restraints, protective helmets); safety footwear; dangers of ingestion and the need for washing hands
	4.2	Work responsibly and use correct manual handling techniques when maintaining a safe working area	<ul style="list-style-type: none"> □ <i>Work responsibly:</i> movement within the work area eg observing restricted area notices, walking not running; acting responsibly at work eg using equipment only for its intended purpose, following approved safety procedures, complying with warning signs □ <i>Manual handling techniques:</i> handling of loads eg pushing, pulling, levering; lifting positions eg from ground level, waist high, overhead, reaching over; the use of lifting aids; when to seek help with lifting a load □ <i>Maintaining a safe working area:</i> good housekeeping arrangements eg maintaining cleanliness of the work area, removal of waste materials, storage of materials, tools, equipment and products; maintenance of access and egress eg clear walkways, emergency exits; control of hazards

Information for tutors

Delivery

This unit is about working safely in an engineering environment. It therefore lends itself to being delivered alongside one of the other practical units that need due regard to operating safely. The unit is designed to enable a range of different engineering applications to be used to embed and assess learners' knowledge about and ability to work safely.

Statutory and organisational requirements must be covered in enough detail to ensure learners know their and others' responsibilities. They should recall their knowledge of these aspects to confirm their awareness of these things before they are exposed to practical activities to demonstrate the safe working. It may be appropriate to devise activities that are straightforward but allow learners to engage in their learning. Activities such as the use of crossword puzzles or simple gapped handouts may be appropriate and/or research of internet sites. This approach may also be suitable for learning outcome 3 where learners need to know about hazards and their control.

The other two learning outcomes, about following accident and emergency procedures and applying safe working practices, may be best addressed through role-play exercises and visits from professional people such as talks from the fire brigade or first aid officers. Practical 'walk throughs' in the workshop set up with hazards would also engage learners when spotting the hazards. Competitions could be set up so learners participate fully. Alternatively, a visit to a local engineering company with a strong focus on health and safety would also be useful. There are many videos and DVDs available to support good health and safety practices.

Assessment

The centre will devise and mark the assessment for this unit.

Learners must meet all assessment criteria to pass the unit.

Outline learning plan

The outline learning plan has been included in this unit as guidance.

Topic and suggested assignments/activities

Know about statutory regulations and organisational requirements

Whole-class, tutor-led discussions supported by small-group internet research into different regulations and organisational requirements.

Individual activity run a competition to see who can find the most useful sources of information about complying with regulations and organisational requirements.

Learners devise and play each others' crossword games on the terminology found in health and safety regulations.

Either watch DVD/video or arrange for a visiting speaker to talk/present the importance of regulation in health and safety.

Some of the assessment of this part of the unit is likely to be achieved within activities for one of the other practical units where learners could reflect on their practical activity and list the regulations and general practices and procedures appropriate to their activity, providing they meet the number required by the assessment criteria. However, this must include a further activity to identify the seven warning signs of substances and a written activity to describe when officials and health and safety literature would be used to assist compliance with statutory regulations and organisational requirements.

Know about accident and emergency procedures

Individual activity completing 'gapped handouts' about location points, name and location of first aider etc.

Workshop walk through to identify emergency alarms and escape routes etc.

Visiting speaker, for example fire officer/brigade or safety officer.

Evaluation of example company policies and procedures.

Whole-class, tutor-led discussions supported by small-group role play relating to procedures for accidents and emergency.

Although assessment of this part of the unit could be achieved within activities for one of the other practical units, when learners could be asked questions about the correct procedures, it is more likely that a scenario or role play will be needed that allows learners to reflect on and then describe the correct procedures, as required by the assessment criteria.

Know about controlling hazards in the engineering workplace

Whole-class presentation about hazards and controls.

Visit to an engineering company to see how hazards are controlled – this would complement any learning from learning outcome 1.

Paired activity, walk through the workshop to 'spot' potential hazards. Set up a competition and reward best answers with points.

Individual activity – match hazards with a control.

Assessment of this part of the unit is likely to be achieved through a straightforward knowledge-based assignment involving the identification of hazards and the control measure used to minimise risk for these hazards in an engineering environment.

Topic and suggested assignments/activities

Be able to apply safe working practices and procedures

Run a competition of 2 or 3 groups, with say, 4 or 5 learners in each group, ask them to prepare themselves to carry out different given engineering activities and award points according to how well prepared they are from a safety point of view.

Individual activity – use a gapped handout to identify different safety equipment found in an engineering workshop (see content under learning outcome 4).

Individual activity – practise manual handling for a range of scenarios.

Whole-class, tutor-led activity to identify good health and safety practice in DVD/video.

Assessment of this part of the unit is likely to be achieved within activities for one of the other practical units. Alternatively, a straightforward engineering activity could be devised to ensure learners have opportunities to prepare themselves for a work activity and work responsibly when carrying out a given task, as required by the assessment criteria.

Assessment

Due to the nature of the assessment requirements for this unit it is likely that some evidence could come from activities being carried out in other units. If this is not the case, engineering activities that will have to be arranged to meet the requirements of this unit as a stand-alone assessment instrument. 1.1 and 1.2 could be assessed through a practical activity which involves the need to comply with statutory regulations and organisational requirements but will also need to cover sources of information to be used to meet 1.4. Learners could reflect on their practical experience before listing the regulations and general practices and procedures and describing when sources of information would best be used. Consideration of statutory regulations should be based on the application of the Health and Safety at Work etc Act 1974 but should also include general and specific regulations as listed in the unit content. It would be best to link assessment of the criteria associated with learning outcome 1 with those for learning outcome 4 where learners need to apply safe working practices and procedures. Additionally, learners need to identify the seven warning signs for 1.3 which could be achieved by them recognising a range of images and stating which are which. Further activities could be added to address 4.1 and 4.2 when learners must prepare themselves to carry out an engineering activity and work responsibly when using manual handling techniques and maintaining a safe working area. The evidence would be mainly based on a witness statement/observation record supported by annotated photographs for 4.1 and 4.2 and lists for 1.1 and 1.2, along with an identification of the warning signs and a description of the use of sources of information for 1.3 and 1.4 respectively. Sources of information must include officials, literature and the seven main groups of labelling hazardous substances. Practical work must involve preparation that covers the content listed under learning outcome 4.

A second assignment could be developed to cover 2.1, 2.2, 3.1 and 3.2. This assignment could comprise a practical scenario for the criteria associated with learning outcome 2 where a simulated activity should be arranged to allow learners to follow a procedure for an accident and to react in response to an emergency alarm. They could then be asked to describe the procedures. Alternatively, a 'case

study' could be given and learners asked to describe the correct procedures. It is likely that evidence for this part of this assignment would be a written description. However, for learners unable to respond in this manner a witness statement/observation record could be used. After identifying a range of hazards with a hazard checklist, a further written activity should be developed to allow learners to identify the controls required to reduce the risk in these hazards. Evidence could be in the form of an annotated workshop layout identifying the hazards and a written list of control measures for each.

Suggested resources

Health and Safety Executive – *Essentials of Health and Safety at Work* (HSE Books, 2006) ISBN 0717661792

Health and Safety Executive – *Management of Health and Safety at Work* (HSE Books, 2000) ISBN 0717624889

Health and Safety Executive – *A Guide to Risk Assessment Requirements: Common Provisions in Health and Safety Law* (HSE Books, 1996) ISBN 0717612112

Websites

www.hmsa.gov.uk

www.hse.gov.uk