



Demonstrate knowledge of and apply health and safety
in the electrical supply environment

US 18038

Training and Assessment Resource

NCES Level 2

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Introduction to Training Assessment Resource

This Training Assessment Resource (TAR) contains the information that you require to complete the written assignment in the assessment pack for this unit standard.

Purpose

People who obtain credit for this unit standard are able to, in an electricity supply environment:

- > Describe employer and employee obligations for safety
- > Describe how health and safety obligations are achieved on electricity supply sites
- > Manage hazards
- > Maintain and monitor safety on an electricity supply work site
- > Report site

Introduction

This unit standard is about electricity supply industry statutes and codes, use by workers in the electricity industry. Statutes and codes are an important aspect of the industry as they are guides to enhancing safety and minimising the risk of injury to people and property.



Activity

What do you consider to be your employer's obligations in terms of safety in the workplace?

What do you consider to be your obligations (as an employee) in terms of safety in the workplace?

1. Obligations for Safety



The electrical industry is distinctive amongst the service industries in that it has its own legislation that has as its central focus the twin themes of technical direction and safety. This has been so since the first set of wiring rules.

It was recognised from the outset of planning of the distribution system that electric shock resulting from a potential difference applied between different parts of the body could either directly or indirectly kill. This approach to safety has been carried on into the current Electricity Regulations Compilation 2003 - in particular regulation 69. This includes:

1. Works, electrical installations, fittings, electrical appliances, and associated equipment must be designed, constructed, maintained, installed, and used so as to be electrically safe.
2. Subject to subclause (3) and (4), for the purposes of these regulations, electrically safe means that there is no significant risk of injury or death to any person, or of damage to any property, as a result of the use of the works, electrical installations, fittings, electrical appliances, or associated equipment, or the passage of electricity through those works, electrical installations, fittings, electrical appliances, or associated equipment, as the case may be.
3. For the purposes of this regulation, fittings and electrical appliances that are designed and used for medical treatment are not electrically unsafe merely because that medical treatment may cause injury to the patient.
4. For the purposes of this regulation, fittings and electrical appliances that are designed and used for animal stunning, meat conditioning, or fishing are not electrically unsafe merely because they may injure animals or fish, as the case may be.

The above states what needs to be done to make equipment electrically safe and defines the meaning of the term "electrically safe". It does not describe how to do the work to make it safe. This is referred to in regulations 69A, B and C. They specify standards or codes which must be, (or-in some cases may be), complied to ensure electrical safety.

While the electrical legislation is quite precise on its intent towards safety in the industry other pieces of legislation also have an important impact.

1.1 The Health and Safety in Employment Act 1992

The Health and Safety in Employment Act 1992 is fundamental to the wellbeing of New Zealanders. It allocates responsibilities for safety and health in the workplace and in doing so affects most people including employers, the self-employed, employees, contractors, principals, or people in control of buildings, equipment or materials. Duties also extend through regulations to those who control workplaces, design and construct buildings, or manufacture or supply plant or materials.

The Act is administered by the Occupational Safety and Health Service (OSH), an agency that comes under the Department of Labour. When introduced the Act adopted a new legislative approach for promoting health and safety management in places of work. The focus, being on the prevention of harm arising out of work activities. It repealed much of the earlier industry-specific legislation, and replaced it with a single Act providing comprehensive coverage of places of work whether in the state or private sector. The Act also treats similar hazards with similar procedures, whatever the place of work.

Primary responsibility is placed on the employer, who has a general duty to provide a safe and healthy work environment. There are other specific duties, including a requirement for employers to identify and actively manage hazards in the workplace. To do this, it sets out a hierarchy of action where employers must follow a process of identification, elimination and isolation. If a hazard cannot be eliminated or isolated, the effects of the hazard must be minimised. Regulations provide minimum standards for particular high-hazard industries and work practices. Guidelines developed by, or in consultation with industry also may outline good practice, such as the Safety Guide Electrical Industry, (GSG-EI July 2000). Some guidelines are approved by the Minister of Labour as "approved codes of practice" providing an accepted means of complying with the Act.

A number of previous Acts and Regulations were repealed in whole or in part on 1 April 1993.

These are listed in detail in schedules to the Act. The provisions in these Acts were either incorporated into the Act or promulgated as Regulations made under the new Act. The major Acts changed affecting electrical workers were the:

- > Boilers, Lifts and Cranes Act 1950
- > Construction Act 1959
- > Factories and Commercial Premises Act 1981

The Health and Safety in Employment Act's principal object is to prevent harm to employees at work. Employers and others are also expected to ensure that their actions at work do not result in harm to other people, including members of the public. Section 5 of the Act sets out the principal objective, it also lists three means contained in the Act to achieve it as follows:

- > It promotes excellence in health and safety management;
- > It requires people in places of work to perform specific duties to ensure that people are not harmed as a result of work activities; and
- > It provides for the making of regulations and approved codes of practice relating to specific hazards.

The Act imposes duties on a wide range of working relationships in nearly all places of work. The different parties in the workplace that are affected by the Act include:

- > Employers;
- > People who control places of work;
- > Self-employed people;
- > Principals of contracts; and
- > Employees

Frequently a person will have duties under more than one section of the Act. For example, an employer may have duties:

- > To employees (sections 6-14);
- > To ensure that the action or inaction of employees does not endanger the public (section 15);
- > As a person in control of a place of work (section 16);
- > As a principal to a contract (section 18);
- > In the event of accident, injury or illness (sections 25 and 26); and/or
- > To comply with notices, sampling or other requirements of health and safety inspectors and/or departmental medical practitioners (sections 31, 33, 35, 37, 39-45).

Similarly, an employee has duties:

- > Not to endanger themselves or others (section 19);
- > Not to interfere with an accident scene (section 26); and/or
- > To comply with notices, sampling or other requirements of health and safety inspectors and/or departmental medical practitioners (sections 31, 33, 35, 37, 39-45).



Activity

Using the Health and Safety in Employment Act, answer true or false to the following statements:

Under the Health and Safety in Employment Act an employer has a responsibility to identify all hazards. True or false?

The Health and Safety in Employment Act requires an employer to minimise, eliminate but not to isolate significant hazards. True or false?

An employer is responsible for training staff to perform their work safely. True or false?

1.2 The Accident Compensation Act 1972

Accident Compensation Act 1972 is a Body Corporate set up to administer the Accident Compensation Act 1982. The Accident Compensation Act 1982 provides accident compensation for all New Zealanders and visitors to New Zealand in the event of an accident of any type in any circumstances. The scheme is funded by employers, self-employed persons, and by the owners of motor vehicles.

Accident Compensation Act 1972 (ACC) covers the following:

- > Accident
- > Work related gradual process disease or infection
- > Medical mishap or error
- > Sexual assault and abuse

ACC covers the following groups of people:

- > All earners injured in accidents
- > All non earners
- > Earners who suffer a work related gradual onset injury
- > People injured in road accidents
- > People injured through medical misadventure
- > Overseas visitors injured in New Zealand

All claims for all injury accidents are made to the ACC. The forms completed by the accident victim are:

- > ARC/1 Application for Entitlement
- > ARC 1A Supplement to the Application for Entitlement

The employer completes the ARC/3 Earnings Certificate - By Employee

The ACC also plays an active and coordinating role in the promotion of general safety in the workplace and in wider society e.g. sports.

2. Achieving Health and Safety



A place of work is defined very broadly in the Health and Safety at Work Act 1992. It is any place (not necessarily part of a building or structure) where any person is to work, is working for the time being, or customarily works for gain or reward, in relation to an employee, it includes a place, or part of a place under the control of the employer, where an employee:

- > Comes or may come to eat, rest or get first-aid or pay;
- > Comes or may come as part of their duties, to report in or out, get instructions, or deliver goods or vehicles; or
- > May or must pass through to reach a place of work.

Domestic accommodation provided for employees is not considered a place of work.

Officers, directors or agents of a body corporate have duties. Where their actions or decisions lead to breaches of the Act by the company or other body corporate, they may be charged, whether or not the body corporate is prosecuted (section 56).

Where the Act imposes a duty on one person, it may apply to another person at the same time, and in the same or a different capacity. This means more than one person may be held liable for a particular breach of the Act, or the same person held liable under more than one section. The Act applies to local and central government agencies including departments, Crown-owned entities, or State-owned enterprises. Chief executive officers of government agencies are responsible for ensuring that the state meets its obligations as an employer under the Act. There are, however, some exemptions in relation to the defence forces. Government departments or Crown-owned entities may not be prosecuted under the Act, but where its provisions are contravened the Secretary of Labour or any individual directly affected may apply to the High Court for a declaration. These requirements are set out in section 3. Other legislation may impact on health and safety in the workplace, even though it is not primarily concerned with the issue. Examples of this other legislation include:

- > The Gas Act 1992,
- > The Building Act 1991, and
- > The Electricity Act 1992.

In these cases there may be some overlap with the Health and Safety in Employment Act 1992.

The general principle is that, where two pieces of legislation apply to any given situation, an employer or any other person affected needs to follow both. In effect, meeting the requirements of the other legislation will usually mean that the requirements of the Health and Safety in Employment Act are being met in relation to the particular hazards covered. Where appropriate, formal agreements have been reached between administering departments to clarify roles and responsibilities. Where the gravity of a particular offence justifies it, criminal charges under the Crimes Act may take precedence.

An employee who has management or supervisory responsibilities as part of his or her job has the duties of an employee, and there may be occasions when he or she will represent the interests of the employer.

A self-employed person has similar responsibilities to an employee, and may also have duties:

- > As a person in control of a place of work (section 16); and
- > As a principal to a contract (section 18).

A person in control of a place of work is responsible for taking all practicable steps to ensure people in the vicinity are not exposed to harm regardless of the purpose for which they are in the vicinity. There is a duty to authorised visitors, not included in the above categories, to warn all people who are to be in the place of work, of known significant, out-of-the-ordinary hazards in the place of work. For this duty to apply, the visitors must have:

- > The express authorisation of the occupier to be in the place of work (subsection 16(3)(c)(i)); or
- > Have given the occupier of the place oral advice that they will be working in the place under statutory authority (subsection 16(3)(c)(ii)).

People visiting a place of work under any other circumstances are owed no duty under section 16 by the occupier. This includes people visiting for the purpose of recreation or leisure. People who are working in the place of work - but not as employees or contractors of the occupier - are owed only the warning duty under subsection 16(3), and then only if they have express or statutory authority to be there. People in control of a place of work have no duty to trespassers.

A person in control of a place of work must take all practicable steps to ensure that customers and clients are not harmed by hazards in or arising from the place of work. This means the customers or clients must:

- > Have paid the person in control (either directly or indirectly) to be there or to carry out some activity in the place; or
- > Are buying or inspecting goods for sale and from the sale of which the person in control would derive some gain or reward (either directly or indirectly).

The case law suggests that this includes the hire or plant and equipment.

2.1 Responsibility for Safety Training

Every employer shall take all practicable steps to ensure the safety of employees while at work. This pivotal requirement of the Act is set out in section 6. It restates the principal object of the Act (from section-5) in terms of a general duty for employers. The section then expands on this general duty by prescribing the following particular duties to:

- > Provide and maintain a safe working environment;
- > Provide and maintain facilities for the safety and health of employees at work;
- > Ensure that plant machinery and equipment in the place of work is designed, made, set up, and maintained to be safe for employees;
- > Ensure that systems of work do not lead to employees being exposed to hazards in or around their place of work; and
- > Develop procedures for dealing with emergencies that may arise while employees are at work.

It is important to remember here that the standard of care that is required of all employers is that they take "all practicable steps". This is an important concept for employers, and others following the Act. Briefly here, "all practicable steps " means doing what can reasonably be done in the circumstances, taking into account:

- > The severity of any injury or harm to health that may occur;
- > The degree of risk or probability of that injury or harm occurring;
- > How much is known about the hazard and the ways of eliminating, reducing or controlling it; and
- > The availability, effectiveness and cost of the possible safeguards.

Another consideration when observing the general duty is that it applies to all types of hazards, not only significant hazards. The extent of the duty is to take all practicable steps to keep employees free from harm at work. This means, for example, that a minor tripping hazard, or a sharp corner that juts into a walkway that presents a foreseeable likelihood of harm and is easily made safe, should be remedied under the duties of section 6. On the other hand, there may be no requirement to manage the hazard under sections 7-10 of the Act, because it is not considered to be "significant".

The focus of this duty is on the "working environment ". The term is not defined in the Act, but it may be taken to include:

- > The workplace itself the building, structure, mine, vehicle, etc;
- > All plant at the workplace;
- > The physical environment including lighting, ventilation, dust, heat, noise, etc;

- > Access to and egress from the workplace;
- > The work process, including expectations of what is done and how;
- > Work arrangements, including the effects of shift-work and overtime arrangements; and
- > The psychological environment, including overcrowding, deadlines, and other stress factors.

The duty relates to the physical work environment, as well as ergonomic, stress, and other psychosocial and "non-physical" aspects of the work environment.

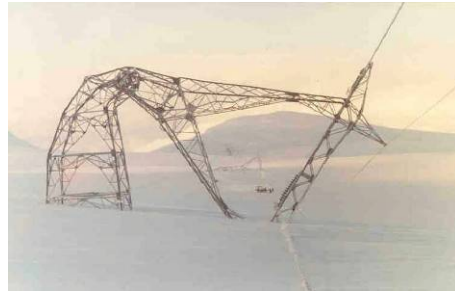
The aim of this duty also provides facilities and equipment not covered by the concept of the "working environment" referred to above. This includes an obligation to provide and maintain first-aid facilities, meal rooms, personal protective equipment, emergency equipment and other ancillary facilities that keep employees and the place of work safe and healthy.



Activity

Describe the process you use for managing hazards in your workplace

3. Managing Hazards



Managing hazards in an electricity supply environment is a particularly important task. Personal safety as well as team safety is very dependent on effective management.

Sections 7-10 of the Health and Safety Act 1992 set out in more detail the steps an employer must take to manage significant hazards in the place of work. These duties complement employers' general duties set out in section 6 of the Act. The process for managing significant hazards is based on the ergonomic principle that the workplace should be modified to suit people, not vice-versa. The steps are:

Identifying hazards

This involves recognising things, which may cause injury or harm to the health of a person, for instance flammable materials, ignition sources, or unguarded machinery (section 7);

Assessing the hazard

This involves evaluating whether the hazard is significant (section 7 (l)(c)) and the likelihood and degree of injury or harm occurring to a person if they are exposed to a hazard;

Controlling the hazard

By taking all practicable steps to eliminate, isolate, or minimise significant hazards (sections 8, 9, 10); and

Monitoring any exposure

Monitoring any exposure to a hazard that has been minimised is identified. (Section 10).

The control of occupational injury and disease hazards should preferably be dealt with by design or redesign, substitution, separation or administration. Employers need to provide employees with the opportunity to be involved in the development of hazard identification and management systems and emergency procedures to be used.

The legal responsibility for safety and health decisions at a workplace rests with the employer, but the consultation process should help employers to reach decisions which take into account information and recommendations provided by employees or a workplace health and safety committee.

3.1 Identifying Hazards

Section 7 requires employers to have in place effective methods to systematically identify hazards to employees at work. Hazards may be, previously existing; new; or potential.

Having identified the hazards, employers must determine which are significant and require further action. When an accident or serious harm occurs, an employer must notify the Occupational Safety and Health Service in the prescribed form. The employer must also take all practicable steps to investigate whether it was caused by a significant hazard.

The concept of a hazard is pivotal to the working of the Act. A hazard is any actual or potential cause of harm. It may occur inside or outside of a place of work. It may be:

- > An activity
- > An occurrence
- > An arrangement
- > A phenomenon.
- > A circumstance
- > A process
- > An event or
- > A situation

A significant hazard is one, which may cause:

- > Serious Harm, this includes death and occupational illnesses and injuries that may be sustained in a place of work; or
- > Harm, the severity of which may depend on how often or how long a person is exposed to a hazard - such as occupational overuse syndrome; or
- > Harm that cannot be detected until a significant time after exposure. This includes long-latency diseases caused by exposure to hazardous substances - such as asbestosis, neurotoxicity, emphysema, and other diseases of occupation.



Activity

Tick the statement(s) that could be defined as serious harm:

- Permanent or severe loss of bodily function
- Amputation of a body part
- A small cut on the arm that does not require stitches
- Burns or loss of consciousness requiring specialist attention
- Any harm that requires hospitalisation for more than 48 hours

In the case of an accident involving injury, who should be notified?

Four commonly used methods of hazard identification are:

Physical inspections

This is the traditional method of identifying hazards by walking around the place of work with the aid of a checklist.

Task analysis

It may be useful to look at the tasks in each job and observe the actions of employees, while identifying the hazards involved.

Process analysis

This involves following the production or service delivery process from start to finish, and identifying the hazards involved at each stage.

Complete analysis and accident investigation details

3.2 Eliminating or Controlling Hazards

Where a significant hazard is identified, the Act sets out the steps an employer must take:

1. Where practicable, the significant hazard must be eliminated (section 8). This may involve removing the hazard or hazardous work practice from the workplace. Elimination is the most effective control measure. It should be noted that substitution - replacing a hazard or hazardous work practice with a less hazardous one does not necessarily result in elimination.
2. If elimination is not practicable, the significant hazard must be isolated (section 9). This may involve isolating or separating the hazard or hazardous work practice from people not involved in the work or the general work such as. It could be done by marking off hazardous areas, or installing screens or barriers.

3. If it is impracticable to eliminate or isolate the hazard completely, then the employer must minimise the likelihood that the hazard will harm employees (section 10). In addition, the employer must, where appropriate:
 - > Ensure that protective clothing and equipment is provided, accessible and used.
 - > Monitor employees' exposure to the hazard.
 - > Seek the consent of employees to monitor their health; and
 - > With their informed consent, monitor employees' health.
 - > This includes introducing work practices that reduce the risk. It could limit the amount of time a person is exposed to a particular hazard, or involve the use of protective equipment.

3.3 Information on Hazards

The Act requires employers to inform employees giving them information on the hazards they may encounter or create in their work (section 12). More specifically, it also requires employers to make available to employees the results of workplace health and safety monitoring (section 11).

Before an employee begins work of any kind their employer must inform them of:

- > Emergency procedures (developed under section 6(e));
- > Hazards the employee may be exposed to while at work;
- > Hazards the employee may create while at work which could harm others;
- > How to minimise the likelihood of these hazards becoming a source of harm to others; and
- > The location of safety equipment.
- > The information that applies to the employee includes:
 - > Audio-visual aids, pictograms or other graphics;
 - > Written materials in the appropriate language;
 - > Checks that should be made to doing work of any kind;
 - > Using plant of any kind; or
 - > Dealing with a substance of any kind, in that "place of work".

The obligation to provide information relates to all existing or potential hazards, not only "significant hazards". Section 12 also stresses the need for employees to be able to understand the information they are given. It requires that the information must be presented in such a form and manner that the employee is reasonably likely to understand it. This may lead to technical information - such as a material safety data sheet, or operating manuals - being interpreted or abridged to meet the needs of employees in a particular place of work. Where employees are not fluent in the English language, or are unable to read English, employers may need to find an

alternative method of providing information. This could apply to employees who speak English as a second language, or to workers who for physical, intellectual, cultural or other reasons are unable to read. Methods, which may be used, include:

- > Organising information to be provided for people in groups with the same language;
- > Using interpreters ensure all information is understood.

4. Maintaining, Monitoring and Reporting On Site Safety



Maintaining and monitoring safety is an important aspect of reducing the risk of accidents in the workplace. At the completion of this element it is expected that students will be able to maintain and monitor safety on an electricity supply work site.

4.1 References

To assist in the maintaining and monitoring of safety on any work site the rules contained in the Health and safety in employment Act should be followed. Another useful publication is General Safety Guide Electricity Industry (GSG-E1) produced by the Electricity Engineers Association of New Zealand. However it should be noted the Act or any associated OSH requirements take precedence over the Safety Guide.

Incidents

To notify people and assist others to identify potential hazards the Energy Safety Service a division of The Ministry of Commerce produces a Summary of Accidents on a regular basis. This can be a useful reference for identifying potential hazards in you work place. The following two examples are extracts from this publication.

Fatal Electric Shock (11,000 volts)

A trainee line mechanic was electrocuted when a wire re-enforced extension ladder he was carrying contacted an 11,000 volt line. He was carrying the ladder up a steep bank. He lost his grip and made a grab for it as the ladder fell towards the line. Contact was made with the wire re-enforced stile. The company was looking at using non-exposed re-enforced ladders or fibre-glass ladders.

Shock, Burns and Fall (11,000 volts)

A line mechanic was investigating a fault on an 11,000 volt line. Relocated a faulty jumper lead. In preparation for the replacement of the jumper he isolated the line, positioned a ladder on the pole and attached temporary earth to the neutral. The line was then tested and the mechanic went to attach the temporary earths to the line. As he moved across some 400 volt lines on the pole he made contact, received a shock and fell to the ground.

The 11,000 volt supply did not isolate the 400 volt supply. It is believed that the live line tester used may have been left on the higher 11,000 volt range for the 400 volt test. The mechanic did not have his arms covered and was not wearing insulating gloves.

4.2 Personal Protective Equipment

In accordance with the Health and Safety in Employment Act your employer is required to provide you with the necessary equipment to allow you to carry out your job safely. It is your responsibility to wear the equipment or clothing in accordance with the manufacturer's recommendations and your enterprise requirements. To maximise the protection of any of the equipment provided you must maintain it in a serviceable condition.

The following are some of the items of safety equipment that you are liable to be required to use in day to day operations and how they should be used:

Overalls

Electrical workers (line mechanics) and their assistants should wear appropriate protective apparel when working on, or in close proximity to, live electrical equipment. The clothing must cover the arms and legs and have flame retardant properties and contain no metallic threads or exposed conductive material. Protective clothing worn by personnel must be, suitable for the tasks being carried out, of correct fit, in good condition and flame retardant material. Clothing made of flame retardant cotton or natural wool gives adequate protection, provided all skin surfaces are covered. (Sleeves rolled down and buttoned at the wrist and legs totally covered).

Hard Hats

Safety helmets must be maintained in a safe condition with regular checks that ensure structural soundness. A safety helmet must not be modified in any way. If a helmet is defective or subjected to a severe impact it must be withdrawn from service and destroyed.

Safety Glasses

A worker must wear properly fitting safety eyewear appropriate to the conditions in the workplace if those conditions are likely to injure or irritate the eyes. Safety glasses should be worn even if working on or testing electrical equipment energised at a voltage as low as 30 volts. Bifocal and trifocal glass lenses must not be used if there is danger of impact unless they are worn behind impact rated goggles or other suitable eye protection.

If the use of polycarbonate or other plastic prescription lenses is impracticable, due to the conditions of the workplace, and there is no danger of impact prescription lenses made of treated safety glass may be worn. Safety eyewear must be fitted with side shields when necessary for the safety of a worker if there is a risk of face injury, suitable face protection must be worn (face shields). Adequate precautions must be taken if a hazardous substance or condition may adversely affect a worker wearing contact lenses. The use of eye and face protection should comply with AS/NZS 1337. General Safety Guide Electricity Industry, Section 10.

Safety Footwear

A worker's footwear must be of a design, construction, and material appropriate to the protection required. To determine appropriate protection the following factors must be considered: slipping, uneven terrain, abrasion, ankle protection and foot support, crushing potential, temperature extremes, corrosive substances, puncture hazards, electrical shock and any other recognisable hazard. In all cases footwear must comply with ASINZS 2210.2 and be maintained in accordance with ASINZS 2210.1. There may be other situations where different types of protection equipment are required; whatever the situation you must wear it for your own safety.

Gloves

When working on or in proximity to any live low voltage situation and -or any de-energised non commissioned or de-commissioned situations which may become energised because of error, accident or system failure, an insulated working glove must be worn on each hand. Insulated working gloves would not be required only where, based on a valid risk assessment, other effective control measures have been implemented to ensure safety.

Safety Vest

If distinguishing safety vest is required for the purpose of identifying a worker's location or well-being, the vest should be of a colour which contrasts with the environment; fluorescent trim should be attached for daytime use and reflective trim for night-time use, on both the front and back.

Ear Defenders

If it is not practicable to reduce noise levels to or below the exposure limits (85db) a worker must be provided with adequate hearing protection. For maximum effectiveness the protection must be maintained and worn correctly. There a number of grades of hearing protection available depending on the maximum noise levels that might be expected. The selection criteria will include daily noise exposure of the worker, worker hearing ability, communication demands on the worker, use of other personal protective equipment, temperature and climate, and physical constraints of the worker or work activity.

Sunscreen

Workers who spend time outdoors must protect themselves from UV radiation by wearing protective clothing that does not transmit visible light; broad-brimmed hats that protect the face, ears and neck; and UV ray-blocking sunglasses. Workers also should frequently apply sunscreen with a Sun Protection Factor of 15 or higher when the sun's intensity is at its peak between 10 a.m. and 4 p.m. Sunscreen should be used with other the other forms of UV protection mentioned.



Activity

Your co-worker does not wear the correct personal protection equipment when carrying out certain tasks as he says it is uncomfortable.

What do you do?

4.3 Site Protection

As the electrical working environment is extremely hazardous it is important that existing conditions related to the safety of the work to be performed shall be determined before work on or near electric lines or equipment is started. The conditions may include, but are not limited to, the nominal voltages of lines and equipment, the maximum switching transient voltages, the presence of hazardous induced voltages, the presence and condition of protective grounds and equipment grounding conductors, the condition of poles, environmental conditions relative to safety, and the locations of circuits and equipment, including power and communication lines.

To ensure that all workers and members of the public are aware of the hazards fencing or physical identification must be carried out. Warning signs or flags by day and reflecting signs or lamps at night shall be used if necessary. Excavations pose extra problems in that the fencing will need to be sturdy enough to support any weight that may be applied and to prevent any person from falling in to the hole.

The details of any site protection requirements will be contained in the Site Safety Plan and any other publications authorised by the particular enterprise. If you have any doubts contact your supervisor.

4.4 Accident and Emergency Procedures

Your employer is required to identify all hazards that may occur on a work site. The employer is also required to put into place any accident and emergency procedures that may be required in the course of your work. This will ensure maximum safety to all personnel involved in the workplace.

This information should be contained in the Site Safety Plan. It should detail any specialist equipment required, alternative means of access or escape for you or the emergency services that may attend the incident. Some of these incidents may include fire, flooding, chemical spillage, gas-leaks, live cabling, serious injuries to a worker, traffic accidents or a trench collapse.

Your responsibility in all cases is to ensure that the procedures set out in the Site Safety Plan are followed and if you are not directly involved you should assist in any way possible. The General Safety Guide Electricity Industry (GSG-EI) sets out some guidance on some of these matters.

Reviewing Safety Plans

It is important that you are aware of the information contained in the Site Safety Plans as your safety depends upon them. To this end you should have some say in what they contain. Periodical reviews are carried out on the Site Plans and if you have any concerns you should put them forward for consideration.

If your concerns are such that they affect immediate safety on a work site take them directly to your supervisor for action. The Site Plan may be able to be amended on the spot. If the Site Plan is amended in any way all affected workers must be notified. There will be a process in place for any amendment action.



Activity

Briefly describe the procedures you would use in your workplace in the following emergency situations:

A chemical spill

A fire




Live electricity (e.g. live conductor on the ground)




4.5 Manual Signalling of Cranes



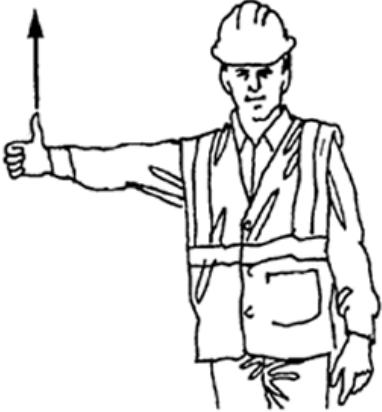
The work that you are going to carryout is not always going to be at ground level. There are going to be times when a crane or another form of lifting machinery will be used to assist you with your work. As it is quite likely that you may be required to communicate with the machine operator so you should have an understanding of the basic movement signals. Care must be taken to use the signals of that particular site. As well as hand signals whistle can also be can be used. AS 2550 gives both hand signals and whistle signals.

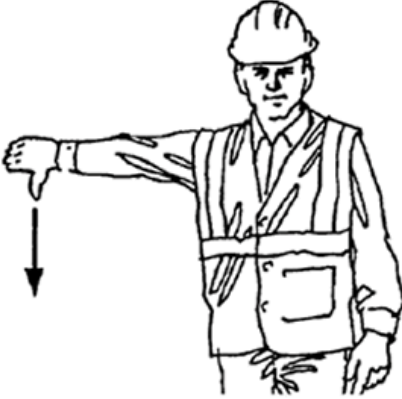


Below is shown a selection of the hand signals provided in Appendix B of the "Approved Code of Practice for Cranes". This Code of Practice can be obtained from the Occupational Health and Safety Service (OSH). The appropriate Web page is




<http://www.osh.dol.govt.nz/publications/booklets/cranes-acop/appendix-b.shtml>




Signal	Description	Example
Stop	Extend one arm and hold palm of hand vertical. Note: emergency stop is indicated by holding both arms up.	
Stop (b)	Arm extended, palm down, move hand right and left. Usually for different level operations.	
Hold everything	Clasp hands in front of body.	

<p>Move slowly</p>	<p>Place one arm motionless across chest in conjunction with or before giving any other directional signal. ("hoist slowly" shown as example.)</p>	
<p>Hoist</p>	<p>With forearm vertical, forefinger pointing up, move hand in horizontal circles.</p>	
<p>Lower</p>	<p>With arm extended downward, forefinger pointing down, move arm in horizontal circles.</p>	

<p>Use main hoist</p>	<p>Tap fist on head, then use regular signals.</p>	
<p>Use Flyline (Auxiliary Hoist)</p>	<p>Tap elbow with one hand, then use regular signals.</p>	
<p>Raise boom (luff up)</p>	<p>Arm extended, fingers closed, thumb pointing upward.</p>	

<p>Lower boom (luff down)</p>	<p>Arm extended, fingers closed, thumb pointing downward.</p>	
<p>Slew</p>	<p>Arm extended, point with finger in direction of swing of boom. Overhead gantry crane - Arm extended, point with finger in the long-travel or cross-travel direction.</p>	
<p>Raise the boom and lower the load</p>	<p>One arm extended, fingers closed, thumb pointing upward. Other arm extended downward with forefinger pointing down, move arm in horizontal circles.</p>	

<p>Lower the boom and raise the load</p>	<p>One arm extended, fingers closed, thumb pointing downward. Other arm vertical with forefinger pointing up, move arm in horizontal circles.</p>	
<p>Extend hydraulic boom or trolley out (tower crane)</p>	<p>Both fists in front of body with thumbs pointing outward.</p>	
<p>Retract hydraulic boom or trolley in (tower crane)</p>	<p>Both fists in front of body with thumbs pointing toward each other.</p>	

<p>Travel</p>	<p>Arms bent at the elbows, fists clenched, rotate both forearms around each other, then point in the direction of travel.</p>	
<p>Travel (one track - crawler cranes only)</p>	<p>lock the track on the side indicated by the closed fist. Travel opposite track in the direction indicated by circular motion of other fist rotated vertically in front of body.</p>	
<p>Finished with crane</p>	<p>Place arms above head and cross hands.</p>	

4.5 Traffic Management Plans

When any work is to be carried out on or very near to public roads or highways a Traffic Management Plan (TMP) must be in place. A traffic management plan is required for each occasion and must go through an approval process. Approval must be obtained prior to commencing the activity. If an amendment to the TMP is necessary a new TMP must be raised and approved. As the work site is a dynamic situation minor amendments may be necessary. If an amendment at the work site is necessary the Site Traffic management Supervisor (STMS) supervisor must approve it. Any changes must not compromise the safety of the site and minimise disruptions to the traffic. Changes must be documented for forwarding on to the Road Controlling Authority.

Traffic Control

On occasions you may be required to control traffic around lines, or other electrical equipment on work sites.

The layout and control of these sites is determined by a Traffic Management Plan as detailed in the Transit (NZ) document "Interim Code of Practice for Temporary Traffic Management in New Zealand (October 2000). It can be purchased from Standards New Zealand or Government Bookshops.

The most important considerations in these situations are:

- > That you are qualified to carry out traffic control;
- > That the direction you give to the motorist is very clear and that it is unable to be misunderstood;
- > The site area must be well marked with warning signs some distance away from the operation so that motorist plenty of warning and time to slow to a safe speed, or if necessary stop;
- > During daylight well placed cones should be used to guide the traffic to where you want them to go; and
- > At night the traffic controller must be illuminated and must still use the stop - go signs, however signalling wands should also be used.

Sign Layout Distances for Level 1 Traffic Management

Permanent Speed Limit		50 km/h	60 km/h	70 km/h	80 km/h	100 km/h
		m	m	m	m	m

Traffic Signs

1. Sign Visibility Distance		50	60	70	80	100
2. Warning Distance		75	90	105	120	150
3. Sign Spacing		35	45	50	60	75

Safety Zones

4. Longitudinal		15	20	30	45	60
5. Lateral						
a. Behind Cones etc.		1	1	1	1 J	J
b. Behind Concrete Barrier		0.5	0.5	0.5	0.5	0.3
c. Behind Other Barriers		As recommended by manufacturers				
	30 km/h	50 km/h	60 km/h	70 km/h	80 km/h	100 km/h
6. Minimum Lane Width	2.75	3.00	3.00	3.05	3.25	3.50

Tapers

7. Length Per Lane *		50	60	70	80	100
8. Minimum Distance Between Tapers		50	60	70	80	100

Delineation Devices

Spacing in Taper		2.5	2.5	5.0	5.0	5.0
Spacing (On Approaches, Between Tapers and Around the Working Area)		5	5	10	10	10

* Taper length is based on a single lane shift of 3.5 metres.

4.6 Registration of Accidents

The Health and Safety in Employment Act requires that serious accidents (which are basically those accidents where the victim requires any kind of medical attention) be reported to the appropriate authority. The appropriate authority will be detailed in the relevant legislation depending on the type of work being carried out at the time. The legislation could be any of the following and could include more than one:

- > The Health and Safety in Employment Act 1992;
- > The Health and Safety in Employment (Prescribed Matters) Regulations 1993;
- > The Health and Safety in Employment (Pressure Equipment, Cranes and Passenger Ropeways) Regulations 1999;
- > The Electricity Act 1992;
- > The Electricity Regulations 1997;
- > The Gas Act 1992;
- > Dangerous Goods Act
- > The General Safety Guide - Electricity Industry (GSG-EI) is the electricity supply industry's publication for procedures and guidelines. In section G313, Reporting Accidents and Near Misses, it states that:

Employees shall report promptly (see appendix B);

1. All accidents, however slight,
2. Any near miss, i.e. any event that in other circumstances might have caused harm to an employee or any other person.

Appendix B gives more detail of the Electricity Industry requirements for accident reporting. It must be remembered that the industry guidelines are just that and that any legislation is the over-riding authority. A copy of appendix B of the General Safety Guide has been reprinted below for your information.

Appendix B: Accident Notification

1. Accidents - General
 - a. All accidents, however slight, shall be reported to the supervisor immediately.
 - b. A register of all personal injury accidents shall be maintained.
2. Serious or Fatal Accidents. Immediately following a serious or fatal accident, the most senior person present shall take the following actions:
 - a. Tend to anyone injured and arrange medical care.
 - b. Notify the senior management of both the victim and the asset owner.

- c. Notify the local Department of Labour (OSH) and the Energy Safety Service of the Ministry of Consumer Affairs if appropriate.
 - d. In the case of a fatality, notify the Police.
 - e. Ensure that the accident site is not interfered with or disturbed except to the extent necessary to save life, prevent harm or restore essential services.
 - f. Request instructions from senior management regarding accident investigation requirements.
3. Notification and recording of accidents shall be as required by the following:
- a. The Health and Safety in Employment Act 1992, The Health and Safety in Employment (Prescribed Matters) Regulations 1993, The Health and Safety in Employment (Pressure Equipment, Cranes and Passenger Ropeways) Regulations 1999.
 - b. The Electricity Act 1992 and the Electricity Regulations 1997.
 - c. Any other relevant legislation, e.g. The Gas Act 1992, Dangerous Goods Act.
 - d. Industry procedures.

The accurate recording and use of registers are important tools in formulating procedures that may reduce the frequency and/or severity of accidents in the workplace.



Activity

Who would need to be notified in the event of a fatality at work?

Next Steps

Well done! You have completed the training assessment resource for Unit standard 18038- Demonstrate knowledge of and apply health and safety in the electrical supply environment.

When you are ready to complete your assessment tasks, please contact your assessor for instructions.

Model Answers to Activity Questions



Activity (page 5)

What do you consider to be your employer's obligations in terms of safety in the workplace?

Primary responsibility is place on the employer, who has a general duty to provide a safe and healthy work environment.

What do you consider to be your obligations (as an employee) in terms of safety in the workplace?

To work safely, not cause any harm to self or others, follow notices and instructions.



Activity (page 9)

Using the Health and Safety in Employment Act, answer true or false to the following statements:

Under the Health and Safety in Employment Act an employer has a responsibility to identify all hazards. True or false?

True

The Health and Safety in Employment Act requires an employer to minimise, eliminate but not to isolate significant hazards. True or false?

False

An employer is responsible for training staff to perform their work safely. True or false?

True



Activity (page 14)

Describe the process you use for managing hazards in your workplace

Answer will depend on workplace but should have the following parts:

Identifying hazards

This involves recognising things, which may cause injury or harm to the health of a person, for instance flammable materials, ignition sources, or unguarded machinery (section 7);

Assessing the hazard

This involves evaluating whether the hazard is significant (section 7 (l)(c)) and the likelihood and degree of injury or harm occurring to a person if they are exposed to a hazard;

Controlling the hazard

By taking all practicable steps to eliminate, isolate, or minimise significant hazards (sections 8, 9, 10); and

Monitoring any exposure

Monitoring any exposure to a hazard that has been minimised is identified. (Section 10).



Activity (page 16)

Tick the statement(s) that could be defined as serious harm:

- Permanent or severe loss of bodily function
- Amputation of a body part
- A small cut on the arm that does not require stitches
- Burns or loss of consciousness requiring specialist attention
- Any harm that requires hospitalisation for more than 48 hours

In the case of an accident involving injury, who should be notified?

All accidents should be reported to the supervisor. If serious harm it must be reported to OSH.



Activity (page 23)

Your co-worker does not wear the correct personal protection equipment when carrying out certain tasks as he says it is uncomfortable.

What do you do?

Advise co-worker that he or she must use the correct personal protection equipment and if not he or she will be reported to the supervisor.



Activity (page 24)

Briefly describe the procedures you would use in your workplace in the following emergency situations:

A chemical spill

Depends on company procedures, e.g. use spill kit to clean up and report to supervisor.

A fire

Depends on company procedures, e.g. raise the alarm, only fight if can do so safely, evacuate the area.

Live electricity (e.g. live conductor on the ground)

Depends on company procedures, e.g. make area safe, keep people away, isolate if possible, advise supervisor.



Activity (page 35)

Who would need to be notified in the event of a fatality at work?

OSH and Police

Filename: 18038 L2-2-1.doc
Directory: G:\Portal_ISD\Training Material\TARs
Template: C:\Documents and Settings\Blair Rorani\Desktop\Completed\ESITO
TAR template v2.dot
Title: ESITO TAR template
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Keywords:
Comments:
Creation Date: 12/09/2008 13:29:00
Change Number: 2
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