TOPIC 3
General Safety

Quick Find

This topic provides information on practices, procedures and equipment that have been designed to maximise safety on the mine site. To ensure your personal safety, the safety of your workmates and the safety of mine equipment, ensure that you become familiar with and understand the information in this topic.

> ***Note:***
>
> ***Remember, any task or duty can be completed without accident or incident as long as you follow the procedures.***

1. SAFETY SIGNAGE

This section provides information on the signs that you will encounter on the mine site. Most signs are self-explanatory, but if you encounter a sign where the meaning is not clear, seek advice before commencing work in the area covered by the sign.

WHY DO WE NEED SAFETY SIGNAGE?

Safety signs draw your attention to objects and situations affecting your health and safety.

Safety signs are placed in strategic locations as close as possible to hazardous areas. If they become damaged or unreadable, please report this to your supervisor so that the signs can be replaced.

A sign that displays a distinct safety message carries the same authority as a direct instruction from your Supervisor.

> ***Note:***
>
> ***Safety signs are placed for your protection. Never deface or cover a safety sign. Do not remove them unless you have been authorised to do so.***

WHAT ARE THE DIFFERENT TYPES OF SIGNS?

All safety signs used on a mine site must meet the relevant Australian Standards. Therefore the safety signs that you will find at every mine will fall into the following types.

Contents of this Topic

Mandatory Signs (Blue and White)

Mandatory signs indicate an instruction that **must be carried out.**

Prohibitory Signs (RED CIRCLE WITH A SLASH)

Prohibitory signs indicate an action or activity that is **not permitted.**

Warning Signs (Black and Yellow)

Warning signs indicate a hazard or hazardous condition that is **not likely to be life threatening.**

Danger Signs (Red, Black and White)

Danger signs warn of a hazard or hazardous condition that is **likely to be life threatening.**

Emergency Information Signs (Green and White)

Emergency information signs indicate the location of, or direction to, emergency related facilities such as exits, safety equipment, or first aid facilities.

Fire Related Signs (Red and White)

Fire related signs indicate the location of fire alarms and fire fighting equipment and facilities. Protective devices of various types are provided throughout the site. Remember these signs and services are for YOUR benefit, and, as such, it is in your interest to ensure they are clear and noticeable, and the equipment is serviceable. In this way, the equipment can serve the purpose for which it was intended.

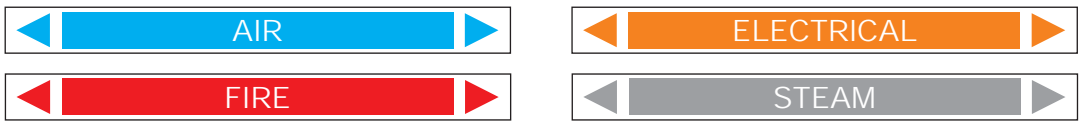
Hazchem Signs

Hazchem signs and placards are used to identify dangerous goods whenever they are packaged, transported, or stored. The design, text size, and colours used on the various signs and placards are specific to the type of dangerous goods to which they relate.

Pipe Markers

Pipe markers are labels which are fixed to a pipe, conduit, or duct in order to identify its purpose or contents. They are placed where pipes need to be quickly identified in case of an emergency, or to distinguish one pipe from another, where several are installed side-by-side.

A specific colour is assigned to each type of substance or service.



Hazard/Barrier Demarcation Tape

Hazard and barrier tape is used to temporarily identify safety hazards, or define an area into which you should not enter.

Red and white: Danger - no access allowed

Yellow and black: Caution - area may be entered but use caution.

Demarcation tape is used to permanently define the boundaries of areas such as:

- **safe areas** — walkways, shoulder points, etc.
- **clearance areas** — within which the automatic movement of machinery creates a safety hazard
- **clear access areas** — where access to fire suppression equipment, exits, etc. should be available at all times
- **set-down areas** — where materials or equipment may safely be put down and left.

Painted floor markings

In some instances painted lines and markings may be used instead of adhesive tape to define the area boundaries.

Ensure that you are familiar with the signage and markers used on the mine site and that you follow their instructions at all times.

2. PROTECTIVE DEVICES

The following devices are used wherever they are required around mine sites.

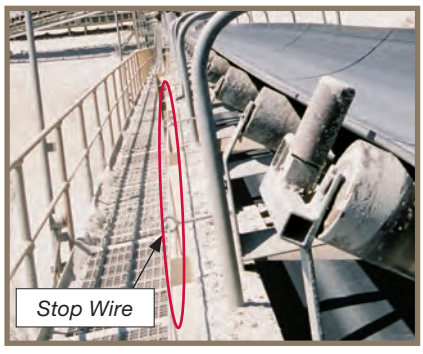
AUDIBLE AND VISIBLE ALARMS

Sirens, horns, flashing lights and other audible and visible alarms are used to signal faults, equipment start/stop warnings, reversing vehicles, equipment failure, tank levels, blasting, etc. You should become conversant with each signal in your work area and take the appropriate action when required.

EMERGENCY STOP SWITCHES AND TRIP WIRES

Conveyor Stop Wires

Conveyor emergency stop wires or trip wires are provided on all conveyors. These wires span the entire length of the conveyor so that the equipment can be stopped by pulling the wire.



Note:

Trip wires are not to be used for any purpose other than emergency stops. They are not isolation points for working on conveyors

Local Start/Stop Stations

Local Start / Stop station

Local stop/start stations are installed adjacent to each electric motor-driven apparatus. They are used to start or stop the equipment at start up and shutdown.

Auto/manual switches or buttons are also often provided in the same panel if the equipment is designed to be started and stopped from a central control room. The auto/manual control switches either enable or disable local or remote control depending on which way they are set.

BARRICADES

Barricades are used to indicate restricted access into areas which contain holes, excavations, openings, or areas in which a danger from falling objects is present. Anyone who creates a hole, opening, or is working at height, is responsible for erecting a barricade. Do not enter a barricaded area without authorisation and knowledge of the area.

Barricades can be either a warning or of the protective type.

Warning Barricades — Call your attention to a hazard but offer no physical protection. They consist of barrier tape and stands or posts.

Protective Barricades — Call your attention to a hazard and provide physical protection. This type of barricade consists of posts and rails or chains, or other physical barrier to entry.

In all cases, signage should be erected on each side of the barrier stating the nature of the enclosed hazard.

Protective Barricades


Protective barricades

- Barricades should be erected before the hole is cut and extended as the excavation progresses.
- Numerous excavations in one area may be fenced off effectively by erecting a barricade around the general area.
- Flashing lights should be used on road blocks after dark.
- An entrance, opening, or gate should be placed where practical to allow access/ egress in and out of the barricaded area.
- Barricades should be maintained erect and square.

Safety Berms and Rills (20)

Safety berms and rills are continuous mounds of dirt that are put in place to prevent mobile plant and vehicles from dropping off an edge. They must be constructed in accordance with the legislated standard and are usually constructed at least half the height of the largest wheel of any vehicle to be driven in an area. They should be provided:

- at all dump sites where rear dumping by vehicles takes place
- at any other place where they are required to maintain the safety of mine workers
- along the edge of any open excavation where there is a vertical drop of more than half a metre.

Guide posts with reflective surfaces should be installed along the edges of permanent roadways to define the edge of the road.

If you encounter situations where these devices have been damaged or are in disrepair, you should report the problem to your supervisor.

3. PERSONAL PROTECTIVE EQUIPMENT (21)

Personal protective equipment (PPE) is designed and provided to prevent the injuries that can result from minor accidents. However, you should be aware that **PPE can only be regarded as the last line of defence**. Working safely within the standard operating procedures should be considered the main method of preventing personal injury.

The site's senior management has the obligation to determine which types of PPE are required for which areas of the site. By law, a mine operator must provide sufficient personal protective equipment that is appropriate for the hazards associated with the workers' tasks and which conforms to the relevant Australian Standards. They must ensure the equipment is readily available for use by the workers.

The level of PPE required at a mine will vary with locations on site, eg. the PPE requirements while working in the mine store would be considerably less than those required when working around a mine site.

By law any requirement for PPE to be used will be made clear by the use of appropriately placed signs. The exact PPE requirement for any site will be made clear in the site-specific induction.

Warning:

Signs calling for specific items of PPE should be obeyed at all times. Failure to obey such a sign could result in personal injury or death.

Before going to your place of work, check that you are wearing the appropriate PPE and look at your work mates to check their PPE– it's your responsibility.

TYPICAL DRESS REQUIREMENTS

The typical dress code and PPE requirements on a surface mine site are:

- safety helmet
- approved safety glasses (some sites require safety glasses to be worn in all locations — check with your supervisor for clarification)
- safety boots (safety toe cap)
- hearing protection
- sturdy work clothes, for example:
  - collared shirt (long or short sleeves)
  - trousers or shorts (cotton material only)
  - suitable overalls

To avoid being 'caught up' or trapped in machinery 'nip' points, the following dress standards should be observed.

- All shirts should be worn tucked in.
- Long sleeves should be either buttoned or rolled up.
- Jackets should be buttoned or zipped up.
- Torn or ripped clothing should not be worn.
- Hairnets should be worn by workers with long hair.
- Jewellery should not be worn

SPECIFIC PPE ITEMS

It is important that you understand and accept the reasons for the use of PPE. The following sections provide information on the specific items of PPE that you will use on a daily basis.

All PPE items must meet the relevant Australian standards.

Manufacture and issue dates

Safety Helmets

Safety helmets are important — they protect your head from impact-induced injury. Safety helmets should be worn at all times and in all locations on site except when you are inside

offices, stores, control rooms, training rooms, first-aid rooms, and the bathhouse. Ensure that you have adjusted the helmet you are wearing so that it fits correctly and is not prone to falling off.

- ✘ **Never** paint your helmet or attach unauthorised stickers — the paint or glue may cause a chemical reaction which reduces the helmet's strength.
- ✘ **Never** drill/punch holes in the helmet or modify its shape in any way — structural changes to the helmet will weaken its resistance to impact.
- ✘ **Never** wear a chipped or cracked helmet.
- ✘ **Never** wear a helmet after a solid impact — although the helmet may appear to be sound, it may, in fact, be weakened and should be replaced.

It should be noted that helmets do have a 'use-by date'. At the time of issue, the helmet should be marked with the issue date. Generally, helmet shells have a life of at least 3 years from the time of issue.

Components or harnesses may deteriorate more rapidly in service. Helmet harnesses should therefore be replaced at intervals of not longer than two years (AS1800).

Neck Protection

If you work in the sun, attachments are available to protect against sunburn and ultra violet radiation. To protect the back of the neck, calico neck flaps which fit quickly to safety helmets as well as helmet brim extensions, are available on request. Use these items whenever you feel it is necessary in order to avoid sunburn.

Brim extension with neck flap

Safety Boots

All mine site areas are designated as foot protection areas. You should wear approved safety footwear at all times and in all locations while you are on site. Safety footwear should be in good condition and, where applicable, the laces should be securely tied and of the correct type.

Safety Glasses/Goggles

Your eyesight is one of your most valuable faculties and one of your most vulnerable. To prevent damage to your sight, ensure that you use appropriate eye protection at all times.

On most mine sites, the locations where safety glasses should be worn are similar to those for safety helmets - safety glasses should be worn at all locations except when you are inside offices, stores, crib room, control rooms, training rooms, first-aid room, and the bathhouse.

Goggles offer greater protection for eyes than safety glasses. They will be required in certain circumstances and will be referenced in the relevant Standard Operating Procedure.

Such circumstances may include:

- working where dust is generated
- working with compressed air
- working with pressure hoses
- working with impact tools
- working with power tools
- working with explosives-powered tool
- working with chemicals.

As with other items of PPE, signs will be in place to alert you to the requirement to wear goggles.

If you are in doubt about what level of protection is satisfactory for a given area of work, consult your trainer or work area supervisor.

Face Shields

Certain tasks may require the use of further special face protection in addition to safety glasses. Such tasks may include:

- handling, mixing or using chemicals and other materials including cement
- using compressed air
- grinding
- drilling
- hammering
- chipping rock

The areas in which these tasks are to be conducted will be equipped with safety signage, but should you perceive any potential risk in other areas, you should seek appropriate instructions before commencing with the work.

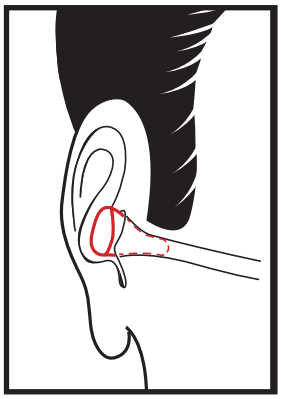
For certain tasks that may be carried out on mine sites, special safety helmets and face shields are available.

The types of task that require special face/head protection may include:

- welding tasks
- tasks where high pressure air or water is used
- certain machining/grinding tasks
- tasks where grit/dust may become airborne (e.g. sandblasting).

Ensure you are using the appropriate protection. If you are in doubt - consult your trainer or work area supervisor.

Ear Muffs/Ear Plugs



A coal mine's safety and health management system must provide ways of ensuring that each coal mine worker's exposure to noise is kept to an acceptable level and that each worker is not exposed to noise levels exceeding the levels stated in the national standard for occupational noise. The mine is required to monitor and record noise levels in the work environment and supply PPE where there is no practical way of reducing noise to an acceptable level. Warning signs must be erected where there are excessive noise levels.

It is a requirement on mine sites to use either ear muffs or ear plugs in areas where signs indicate that hearing protection is required. Ear protection is also required when working around noisy vehicles and equipment.

Where there is no signage, the need to wear hearing protection can be identified when there is a:

- need to frequently speak louder than normal in order to be heard or understood in a noisy environment, while standing within one metre of your listener
- noticeable, though temporary, loss of hearing on leaving an area of noise after an extended period of exposure
- noticeable 'ringing' in the ears on leaving an area of noise after an extended period of exposure.

The chart provides some reference points that show how hearing can be affected by noise.

Effect on People	Sound Level	Sound Source	
Highly Injurious	140 130 120 115	Jet engine Rivet hammer **PAIN THRESHOLD** **Maximum Instantaneous dose without protection**	**HEARING PROTECTION MUST BE WORN**
Irritating	110 100	Chainsaw Sheetmetal workshop	
	85	General standard in Australia for 8 hours exposure	ACCEPTABLE LIMIT WITHOUT HEARING PROTECTION
Non Injurious	80 60 50 40 30 20 10 0	Heavy Traffic Normal conversation Low conversation Quiet radio music Whispering Quiet urban room Rustling leaves **HEARING THRESHOLD**	

Note:

The Australian Standard for a maximum daily dose has been set at 85dB(A) and is based on an 8 hour workday. If you are working for more than 8 hours per day in a noisy environment, the maximum daily dose will be less than 85dB.

An increase of 3 db(A) doubles the noise level to which a person is exposed.

Some of the injurious effects of noise include:

- an affected sense of balance
- stress, which will in turn lead to tiredness, irritability and headache
- raised blood pressure
- reduced clarity of sight and colour perception.

Note:

Remember that noise can also increase the risk of accidents, due to the 'masking' of sounds that would warn of approaching danger.

If you are about to perform any procedure which you suspect could exceed the noise standard, wear the appropriate hearing protection for the duration of the job.

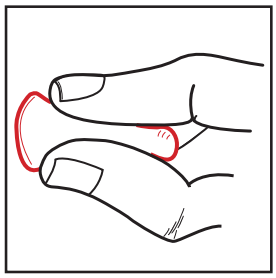
Ear muffs are available on site. Ear plugs are readily available from self-serve dispensers situated at various locations around most mine sites.

Note:

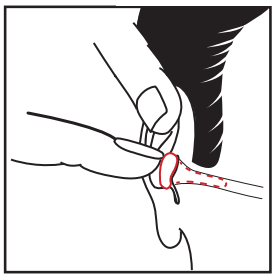
Be hygienic when fitting earplugs — using dirty hands may lead to ear infection.

Never re-use earplugs.

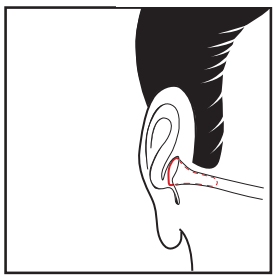
Compressible sponge type earplugs should be fitted using the steps shown below. Fitting instructions may vary from brand to brand – check the fitting instructions on the dispenser or wrapping.



Roll earplug between fingers



Insert fully



Earplug expands to fit

Gloves

Almost one in every four injuries in the workplace involves the hand and there are over 50,000 work-related hand injuries in Australia each year. By using the appropriate gloves in the correct manner, you can help to ensure that you do not become one of these statistics.

The type of hazards that can affect the hands include:

- **heat** — hot or molten materials can cause serious burns
- **cold** — cold ambient temperatures can cause a lack of dexterity and prolonged exposure to cold materials (e.g. steel) can cause aching and soreness
- **wire ropes** — frayed wire ropes can cause serious hand wounds
- **chemicals** — acids, corrosives, and solvents can destroy tissue, cause severe burns and remove natural oils
- **rough materials** — can cause soreness and blistering and even infection
- **electricity** — causes shocks, burns, and possibly death
- **radiation** — causes burns, cancers, and other long term health problems.
- **biological infection** — can be sustained during the performance of first aid procedures on victims who have open or bleeding wounds.

Gloves are available to help you protect your hands against the types of hazards encountered on site. They may include:

- **leather gloves** to protect against sparks and moderate heat, rough surfaces, bruising and wounds caused by frayed wire ropes
- **rubber, vinyl, or neoprene gloves** to protect against corrosive substances such as acids, solvents and petroleum products
- **heat resistant gloves** are made of aluminised fabric or other special materials to protect the hands against flames and other sources of intense heat
- **insulated gloves** made of rubber or synthetic rubber can be used under other protective gloves to insulate against electricity
- **cloth gloves** made of natural or synthetic fibre should be used to protect against moderate heat, moderate cold and moderately rough or sharp surfaces
- **metal mesh gloves** provide protection against cuts and scratches when you are working with sharp tools and objects
- **lead lined gloves** can be used to protect the hands where there is a radiation hazard
- **latex medical gloves** can be used to protect against sustaining biological infection which may be encountered in the carrying out of first aid procedures.

Select and use gloves that will offer the best protection for the type of work you are carrying out. If you are in doubt about which type of hand/arm protection you should be wearing for a particular job, consult your trainer or your work area supervisor.

Barrier Creams

As well as protecting your hands with the appropriate gloves, you should also consider using barrier creams to help avoid skin irritation and soreness. Contact with irritating substances is a common problem. Inflammation of the skin (dermatitis) is the cause of thousands of work days lost nationally. Skin irritation may be indicated by sores, blisters, redness, or dry, cracked skin that is easily infected. Dermatitis may also be caused by:

o Chemicals

Some (like metallic salts, solvents and acids) can injure or irritate the skin immediately upon contact. Others, like certain oils and epoxies, can cause allergic reactions which appear over a period of time.

o Biological Agents

Bacteria, fungi, and viruses may cause skin irritation, infection, or sickness.

The correct use of the appropriate barrier cream can reduce the likelihood of such problems.

- **Dry creams** are used to coat the skin and make cleanup easier; they may protect against very mild acids.
- **Wet creams** are used to protect against irritants which are dissolved in water, such as mild acids and alkalis.
- **Solvent repellent creams** are used to protect against irritating solvents and oils.

Note: When using barrier creams:

- wash hands and dry your hands thoroughly after using hand cleaners
- apply only to clean skin
- re-apply often
- use lanolin to replenish skin oils after using a barrier cream.

Sunscreen Lotions

Sunscreen lotions are available for use where you are exposed to ultra violet light such as when you do prolonged work in the sun. These lotions should be used as directed. The sun screen container needs to be stored in a cool place to ensure the lotion remains effective.

The best sunburn protection is to cover your skin with clothing. The most commonly affected areas are the back of your neck and ears. Wear helmets with wide brim attachments or neck flaps.

Respiratory Protection

Dust mask

Prolonged exposure to a dust laden environment can lead to a lung disease called pneumoconiosis. Coal dust or rock dust having a high quartz content (free silica), is of particular concern. A major proportion of the dust is inhaled into the lungs and breathed out again. However, a small proportion of dust is retained in the alveoli (small air passages) where nature seals off the particles in layers of covering tissues. This eventually forms nodules, which lead to pneumoconiosis. The harmful effects of the dust usually do not develop until a number of years after exposure.

The law defines coal dust and free silica levels which must not be exceeded over an eight hour period in the atmosphere in any work area of the mine. These specified maximum dust levels may change with the increase of shift lengths above eight hours or hours in excess of forty hours per week. Where respirable dust concentrations exceed these levels, employees must be provided with, and must wear, suitable respiratory protective equipment.

Other contaminants in the air you breathe can also cause lung damage which may lead to either short or long-term illness. These include:

- certain fluids carried in the air in mist form
- smoke from certain materials
- certain gases
- paint fumes
- chemical fumes.

Every effort should be made to eliminate or minimise contaminants from the working environment. However, where work must be carried out where contaminants are present, the hazards can be managed by the correct use of an appropriate respirator.

The types of respirator you may be required to use include:

- **filter type** – dust mask, or half-face/full-face respirators with single or double filters for filtering particles from the air. The major considerations in selecting the type of filter are the type or size of the particles to be filtered out and the resistance to breathing caused by the filter. Disposable dust masks are available to protect against 'nuisance' non-toxic particulate contamination. Naturally this type of mask offers only limited protection so it is only suitable for use in certain applications. Disposable dust masks may only be used once. Filters in respirators should be replaced whenever breathing becomes restricted, due to "plugging" by retained particles.

- **chemical cartridge and canister type respirators** - for filtering gaseous contaminants from the air. Chemical cartridge respirators consist of a half mask face-piece connected directly to one or two small containers of chemicals. The chemicals used are similar to those used in gas masks, but cartridge respirators are for use only in non-emergency situations; that is, for atmospheres which are harmful only after prolonged or repeated exposure. No one chemical has been found to remove all gaseous contaminants. Therefore, canisters should be carefully chosen to meet the specific needs of each situation. Such canisters are often colour coded for quick identification. Your supervisor or training officer will provide any detailed information you may require.

  Canister face masks with a full face-piece are generally used for emergency protection in atmospheres immediately dangerous to life

> ***Warning:***
>
> ***Canister masks do NOT provide protection against oxygen deficiency. Therefore, they must not be used when fire fighting.***

- **self-contained breathing apparatus** - tanks contain air fit for breathing and so totally isolates the wearer from particulate and chemical contaminants.
- **supplied air** – wearers of supplied air are connected to an air supply by hose. The higher pressure inside the mask prevents particulates and gases from entering.

Breathing apparatus

The period of protection offered by any given filter or gas mask will depend on factors such as the type of filter or canister used, the concentration of the dust, gas or vapour present, and the activity of the user. Ensure that you are using the correct type of respiratory protection for the environment within which you are working and for the duration you expect to be there.

The selection of appropriate respiratory protection is critical. If you are working with hazardous substances, the Material Safety Data Sheet (MSDS) will indicate the type of respiratory protective equipment that must be used. **Ensure you use the equipment that is called for by the MSDS**.

Most respiratory equipment is specialised and, as such, requires special knowledge for its selection, fitting and use. Discuss the use of respiratory protection equipment with your trainer or work area supervisor.

> ***Warning:***
>
> ***Do not attempt to select or use respiratory protection equipment unless you have received either training or expert advice in its application and method of use.***

When you select an item of respiratory protective equipment, ensure that it is in good condition and that it is correctly adjusted so that it is a 'snug fit'. If there is poor mask-to-face sealing, then the effectiveness of the mask may be reduced or negated entirely. All items of respiratory protection should be inspected each time they are used or on a daily basis if they are used all the time.

Note:

Many forms of respiratory protection are not suitable for personnel who wear beards and some types of facial hair. In these cases, the beard or facial hair prevents correct sealing of the mask to the face. Bearded personnel and personnel with some types of facial hair should not work in locations where respiratory hazards are present.

Disposable Overalls

Disposable overalls are available on most mine sites for those jobs which may be excessively dirty or cause exposure to grease, oil etc. Naturally, these items should be used responsibly and appropriately. Used overalls should be disposed of in the correct manner.

High Visibility Clothing

A number of factors may make it difficult for people to be seen by other workers and plant operators. These include dusty working conditions, working at night, working in dark areas such as wash plants and underground, working in rain and fog, and the expansive nature of many mine sites. It is critical that you can be seen by others so, when working in most areas of a mine site, you will be required to wear high visibility clothing. This will consist of bright orange or yellow vests, orange clothing, and/or clothing with reflective strips. Ensure that you familiarise yourself with the requirements and follow them.

Wet Weather Clothing

Wet weather gear is available for those persons who are required to work in conditions or in areas where they may become wet. Wet weather gear may include the use of gum boots. However, these should be of an approved design and should include safety toe cap and chemical resistant non-slip soles.

If you believe the nature of your work justifies the use of wet weather gear, you should contact your supervisor.

CARE AND REPLACEMENT OF PPE

Mine sites have a policy in place regarding the supply and replacement of PPE. In general, no reasonable request for the supply of PPE will be rejected.

You should, however, ensure that you do not abuse whatever system is in place at your mine site. You can play your part by observing the following.

Do:

- ✔ Take care of your PPE — your health and safety depends on it.
- ✔ Avoid necessary damage to, and wastage of, items of PPE.

Don't:

- ✘ Request or order items of PPE for which you have no need or will not use.
- ✘ Destroy or dispose of PPE that can be readily re-used (gloves etc.).

Be hygienic in your use of PPE. Generally speaking, you should not use another person's items of PPE and you should take care not to self-infect by adopting poor hygiene habits. For example, ensure your hands are clean before fitting 'sponge' type ear plugs.

Given the quality and availability of the equipment it is difficult to understand why PPE is sometimes not used. All that is required is that you make a reasonable effort to maintain the equipment in a serviceable condition and to avoid unnecessary wastage.

Make sure that you are properly instructed in the use of any PPE that you wear. Incorrectly fitted or selected PPE may prove to offer no protection against hazardous substances or environments. **Remember, your personal safety is your personal responsibility.**

4. BATHHOUSE

The bathhouse fulfils both a safety role and a role in personal hygiene. The safety aspect is that any person whose skin comes into contact with solvents or corrosives may use the bathhouse facilities to ensure the skin is cleaned and damage is minimised. The personal hygiene aspect is self-explanatory.

Naturally, to be able to fulfill its intended functions, the bathhouse and its facilities should be kept clean and safe. This includes discarding old razors, sharps, bandaids, bandages etc. in the correct receptacles

Make yourself aware of the Safety and Health Management System as it applies to the bathhouse. If the procedures are not followed accidents can occur in the bathhouse as easily as anywhere on site. Ensure that you use the facilities safely and leave them in a safe condition for the next person.

5. POTABLE WATER (DRINKABLE WATER)

Generally, there are four types of water you may encounter on the mine site. These are:

- **Potable Water** — treated water that is suitable for human consumption.
- **Raw Water** — untreated water that has been supplied to the mine site, usually pumped from a river or a borefield.
- **Process Water** — water that has been used in the treatment process and may be recycled for reuse.
- **Treated Sewerage** — may be used in some areas for irrigation purposes.

As a general procedure, potable water is indicated with a pipe marker which is colour-coded white on blue, while other water markers are coded white on green.

Generally, water tanks and water coolers contain water fit for drinking. If this is not the case, suitable advice will be indicated on an Information Tag or an advisory sign attached to the tank.

Note:

Ensure that any water you drink is fit for human consumption. DO NOT drink from:

- ***hoses***
- ***other water sources not designated as drinking water.***

6. PERSONAL HEALTH AND HYGIENE

Poor hygiene may affect your health and the comfort of co-workers, so:

- consume food only in designated areas
- wear a clean set of work clothes daily
- wash your hands thoroughly using potable water before eating, drinking or using the toilet, especially after working with chemicals
- keep crib rooms tidy and use the rubbish bins provided
- advise your Supervisor or the Safety Department of any conditions that are unhygienic.

7. HEAT ASSOCIATED ILLNESS

Although the incidence of heat illness is not common, it is important to be able to recognise the causes and symptoms and know the treatment for these illnesses because of their serious consequences and rapid development. The five forms of heat illness are:

- heat rash
- heat cramps
- heat collapse
- heat exhaustion
- heat stroke.

- **Heat Rash**

Also known as prickly heat, heat rash is caused by sweat being continuously present on the surface of the skin where there is no relief from hot humid conditions. This, in turn, leads to blockage and inflammation of the sweat ducts. Heat rash is potentially serious because it causes a decreased sweat rate and reduces a person's ability to work in hot conditions. It is prevented by providing cool conditions between periods in the heat conditions.

- **Heat Cramps**

These are painful muscle spasms mostly in the arms, legs and abdomen. They may occur while working (standing or completing repetitive tasks) or hours after working in a hot environment. They are caused either by a loss of fluid or loss of salt from profuse sweating. Prevention of heat cramps can be best achieved by maintaining an optimum state of hydration. Treatment is by administering fluids. Medical attention should be sought for severe cases.

- **Heat Collapse**

Heat collapse (fainting) is the most common form of heat illness. It is a minor disorder caused by pooling of the blood in dilated vessels of the skin and lower part of the body and a reduced return of blood to the heart and hence the brain. Recovery occurs quickly once the casualty lies down. Intermittent activity helps prevent the occurrence of heat collapse.

Although heat rash, heat cramps and heat collapse may not be dangerous, they may indicate personal or ambient conditions that may produce more serious heat illnesses.

- **Heat Exhaustion**

Heat exhaustion occurs as a consequence of a decrease in the volume of blood being circulated, mostly due to dehydration. It may also be caused by improper distribution of the circulation during heat stress. It is more likely to occur in people who are heat intolerant, not acclimatised to heat, or who are in poor physical condition.

Symptoms:

1. weakness, dizziness, disturbed eyesight, headache
2. intense thirst
3. nausea, vomiting, diarrhoea, cramps
4. breathlessness and palpitations, weak pulse and low blood pressure when standing
5. tingling and numbness of extremities.

Treatment:

1. transfer to a cool area
2. administer water to drink
3. if unconscious, treat as for heat stroke
4. medical examination is required before further heat exposure.

Natural thirst is often not enough to replace fluids lost through sweating. You should drink small quantities of cool water frequently. Salt should never be taken during heat stress because dissolving the salt can decrease the volume of blood and increase the heart rate, thereby reducing the body's ability to deal with the heat stress.

- **Heat Stroke**

This is an acute medical condition due to a dangerous rise in body core temperature. It can cause tissue damage often of an irreversible nature and even death.

The sequence of events leading to a heat stroke starts when a person's metabolic heat generation is greater than their heat loss. This can lead to a failure of the body's temperature control centre, reducing evaporative cooling and causing body temperature to rise even faster. The metabolic processes then speeds up, producing more heat and raising the body temperature even faster.

Due to this process of acceleration, it is imperative that the condition be identified quickly and treatment started immediately.

Symptoms:

1. hot and mostly dry skin
2. unconsciousness and coma
3. irrational, confused or aggressive behaviour
4. involuntary contraction and twitching of muscles
5. loss of control of bladder and bowels
6. dilated pupils, vacant stare.

Heat stroke does not occur in all people in exactly the same way. Not all of these symptoms may occur. The symptoms of heat exhaustion when grouped together may be an early warning of heat stroke.

Treatment:

1. it is essential that treatment start immediately, and that medical assistance be summoned immediately
2. lie the person down and cool them with water and air movement. Water should not be too cold as that can cause constriction of surface blood vessels and hinder the cooling process. Air movement can be by a fan, air mover, or by physically fanning the person
3. splash water on the skin and massage the skin in the direction of the heart
4. if conscious, encourage the person to drink small quantities of water frequently
5. apply artificial respiration if breathing fails
6. continue cooling until the person's core temperature drops below 38.4°C.

Accurate diagnosis to assess the degree of damage and the expected recovery requires tissue analysis of a blood sample. Because of the seriousness of the condition, this diagnosis needs to be done even where there is a marginal suspicion of heat stroke.

MINIMISING HEAT STRESS

You can minimise the effect of working in hot and humid conditions by adopting a responsible work attitude and maintaining good ventilation in your work area.

Personal Responsibilities

The following points highlight the ways in which you can reduce the effects of hot and humid conditions:

- drink sufficient fluids to replace the amount lost through sweating – don't wait until you become thirsty as this indicates that you are already dehydrating
- eat suitable foods and do not consume excessive amounts of alcohol
- do not take salt when you are dehydrated
- ensure that you follow any instructions given to you with regard to work procedures in areas where overheating problems can occur
- report hot areas to your supervisor

Management Responsibilities

Supervisors will take readings in any work areas that they consider pose a risk to personnel. These readings are used to identify the type of work and procedures that must be adopted for a certain area. Essentially, there are three conditions levels. These are:

- **caution level** — this is a signal that conditions are moving away from the optimum level and personnel have to be more conscious of their work/rest cycle
- **modified work level** — at this level, any work must be done on a work/rest regime. The length of the work/rest cycle will depend on the employee and the work being done.
- **stop work level** — at this level, any personnel working in the area will be required to stop work and leave the area. The only work that can be done in this instance is work associated with rectifying the lack of ventilation.

8. STANDARD OPERATING PROCEDURES

As discussed in Topic 2, legislation requires the site senior management to ensure that standard operating procedures (SOP's) are developed to manage and control hazards that exist at their mine.

Accidents in the workplace occur for a number of reasons. These may include:

- poor use of hazard identification and risk management processes
- a lack of knowledge of the safety procedures
- a lack of skills to do the job
- attempting to take shortcuts
- a failure to consider the consequences of actions
- forgetting important steps in a procedure
- working with a 'know it all' attitude
- working with a 'don't give a damn' attitude
- working with an 'it can't happen to me' attitude
- inadequate job planning.

Many of these problems can be overcome or avoided by the use of Standard Operating Procedures (SOP) and supporting documents. SOPs and supporting documents provide instructions on how to safely carry out specific tasks.

If you become aware that a task is hazardous, or if a process is modified or a new one introduced, it may be necessary to have an SOP developed or amended through the appropriate procedure.

SOPs are developed and reviewed by the site senior management and a cross-section of the workforce. You may be involved in this process. Changes to an SOP must be communicated to affected coal mine workers eg at toolbox talks or by retraining.

In developing the standard operating procedure, the site senior management must use a risk assessment process that is recognised by the mining industry. They must also have regard to the industry accepted methods of controlling the particular hazard.

Accessing Standard Operating Procedures

The Site Senior Executive / Registered Mine Manager must ensure that an easy to use list of the current SOP's for the mine's coal mining operations is kept in a readily accessible location at the mine.

A copy of the current SOP's for a particular coal mining activity at the mine must be available to each coal mine worker carrying out that activity and must be kept in a location that is easily accessible by those workers.

Familiarise yourself with the SOPs that are available on your mine site and for your particular work area. If an SOP has been written for a task you are about to do, ensure that you obtain a copy and follow its instruction exactly.

> ***Note:***
>
> ***SOPs are considered to be a part of the Site Safety and Health Management System. By not following an SOP you are effectively breaking the law.***

9. COMMUNICATIONS

Communication plays an important part in the day-to-day operation of the mine. As you have already learnt, the senior management is responsible to ensure that a communication system is in place and that the system is used correctly.

We can divide communication into two separate categories – **electronic communications** and **interpersonal communication**. Electronic communications systems may include:

- telephone systems
- approved mobile phones
- two-way radio systems
- intercom systems

All mine sites will be equipped with a combination of these types of system. It is important that you become familiar with the operation of the communication systems on the site.

TELEPHONE SYSTEM

Most sites are provided with telephone systems which enable communications around the mine as well as access to the national network. Ensure that you are familiar with the method of using the telephone system and the site procedures governing its use.

You should also learn the site emergency numbers. These may include numbers for each or all of the following:

- first aid
- fire
- mine rescue
- general emergency number
- numbers for off-site emergency services (e.g. ambulance).

If your mine site allows telephone privileges, ensure that you do not abuse them. Abusing privileges is the quickest way to have them removed.

TWO-WAY RADIO

Two-way radio systems are provided on mine sites to allow easy communication between individuals from all locations around the site. Generally, two-way radios are either portable hand-held units, or fixed units fitted to vehicles and other mobile equipment.

Before you use a two-way radio for the first time, ensure you obtain some instruction from a person who is familiar with its operation.

Such instructions should cover:

- the selection of radio channels
- the operation of volume and squelch controls
- battery replacement/recharging procedures.

The following general two-way radio usage rules should be followed at all times:

DO:

✔ Keep all radio conversations short and to the point. Two-way radios are not to be used for lengthy conversations.

✔ Release the press-to-talk button when you have completed what you are saying. If you keep it pressed, you will not be able to receive the incoming message.

✔ If an attempt to initiate a call fails and you choose to wait for a call back, you should identify yourself and the person you are calling twice before signing off and going into 'stand-by' mode.

✔ If any item of mobile equipment has a defective radio, it is up to you to tag the equipment and make the appropriate defect report.

DO NOT:

- ✘ Use unacceptable language over the radio system
- ✘ Transmit social conversations - radios are to be used for business purposes only
- ✘ Transmit confidential information over the radio
- ✘ Cut into or over other people's transmissions except in an emergency. In the case of an emergency, the word "EMERGENCY" will be repeated three times at the beginning of the message

Caution:

Use radio equipment responsibly. Someone's life may depend upon it.

INTERCOM SYSTEMS

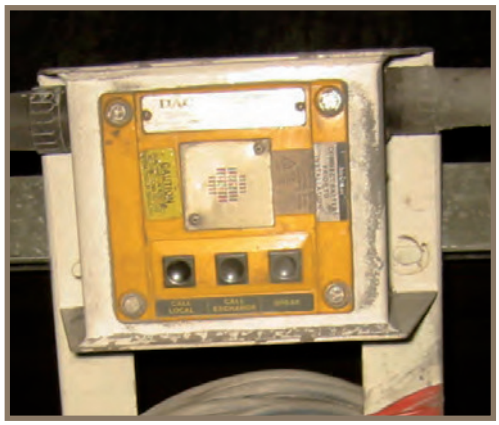
Mines use intercom systems as part of their communication network. A typical intercom system that you might encounter is the DAC intercom.

The intercom console (as illustrated), is normally located in a central position such as a control room. If your job includes the use of the console, you will be given instruction in its operation.

Intercom field units are connected to the central console by cabling. They can be operated in the following manner:

- to communicate with the console operator (control room), press the 'call exchange' button.
- when the operator responds, press and hold the 'speak' button to talk and release the button to listen.
- when the conversation is complete, the console operator (control room), will reset the switching to the 'stand by' mode.

The DAC field units may also be used to communicate with other field units by asking the operator to provide you with a speech path to your desired unit.



DAC unit

MOBILE PHONES

Mobile phones have become an important means of communication at surface mines. If you are issued with a Company phone, you will need to become familiar with their policy regarding its use.

Likewise, you will need to find out your mine's policy regarding the use of your own mobile phone during working hours. Some operations may not allow personal mobile phones on site

In keeping with accepted road rules, you must not use a mobile phone when driving a vehicle or operating mobile plant. Always bring the vehicle to a stop before using a phone.

Do not take a mobile phone within 10 metres of explosives. Do not take a mobile phone into an underground coal mine.

INTERPERSONAL COMMUNICATION

Radio, telephones, and intercom systems provide the means of communication but coal mine workers provide the message.

The quality of the communication between coal mine workers can affect the safety and efficiency of the job as well as making the difference between a pleasant or unpleasant working environment.

The following general hints will make your method of communication more user-friendly:

DO:

- ✔ be prepared to listen as much as you talk
- ✔ get straight to the point — be concise and do not ramble on
- ✔ use correct or site-accepted terminology
- ✔ use simple English — do not try to dazzle workmates with your command of the language
- ✔ ensure instructions you give are precise
- ✔ be an active listener — concentrate on the conversation
- ✔ summarise instructions you have been given so that both you and the person giving the instructions are clear on all points
- ✔ if you are involved in formal meetings, ensure a chairperson is nominated and that you speak 'through the chair'.

DO NOT:

- ✘ raise your voice in ordinary conversation
- ✘ assume or guess what is about to be said to you — you might get it wrong
- ✘ hold important conversations in excessively noisy environments — key points can easily be misheard

Note:

Most of the work-related conversations you have will affect the safety of your workplace.

Ensure you get the communication right.

10. SUMMARY

This topic has provided some information on basic safety around the mine site. All of the measures discussed such as signage, PPE, SOP's, communication systems, and so on are all put in place to ensure the personal safety of all coal mine workers.

No matter how many safety measures are put in place, if they are not used correctly, they will not manage hazardous situations and accidents.

The correct use of safety measures falls to the individual. **You are responsible for your safety and for the safety of those working around you.** Do not be a liability, accept your responsibility and help to ensure you work in a safe environment.