Black Mountain Mining

BMM-HSE-VOH-SOP-012b Plant Confined Spaces V3

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Content Owner(s)
Leonard Magerman (Occupational Hygienist | BMM)

Content Reviewer(s)
Mduduzi Mdluli (Plant Engineer | BMM) Marinus Hanekom (Engineering Manager | BMM)

Content Approver(s)
Tshilidzi Nemakhavhani (Plant Manager | BMM)

CHANGE HISTORY

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DEFINITIONS AND ABBREVIATIONS

Word / Phrase / Abbreviation	Definition
AAWR:	As and when required
Atmospheric monitoring:	The continuous measurement of oxygen levels or selected atmospheric contaminants over an uninterrupted duration of time.
Attendant:	A competent person assigned to remain on the outside of, and near, the confined space and capable of being in continuous communication with and, if practical, to observe those inside and where necessary, initiate emergency procedures. A standby person, who shall be positioned outside the confined space and must have no other duties other than monitoring people and conditions inside the confined space and coordinating with rescue personnel if required.
Competent Person:	A person who has, through a combination of training, education, and experience, acquired knowledge and skills enabling that person to correctly perform a specified task.
Contaminant:	Any dust, fume, mist, vapour, biological matter, gas or other substance in liquid or solid form, the presence of which may be harmful to health and safety.
Entry:	When a person's head, i.e., the breathing zone or upper body is within the boundary of the confined space.
Entry Supervisor:	A competent person assigned, who has a detailed knowledge of the plant, equipment and systems concerned and is responsible for issuing of Permit for Confined Space Entry.
Lower Explosive Limit:	In relation to a flammable contaminant, the concentration of the contaminant in air below which the propagation of a flame does not occur on contact with an ignitions source.
Upper Explosive Limit:	In relation to a flammable contaminant, the concentration of the contaminant in air above which the propagation of a flame does not occur on contact with an ignition source.
Emergency Response Team:	Responsible for confined space rescues and medical first responder duties.
Entrant:	Person accessing and performing work inside confined space. Also authorised as gas tester

Word / Phrase / Abbreviation	Definition
Exposure Standard:	An airborne concentration of a particular substance in the person's breathing zone, exposure to which, according to current knowledge, should not cause adverse health effects nor cause undue discomfort to all persons. Exposure limits (OEL) can be in three forms: time-weighted average (TWA), short-term exposure limit (STEL), or peak exposure limit (PEL).
Lock-out and Isolation:	Ensure that all energy sources are lock-out and or isolated before entering a confined space. i.e., inflows, electricity, hydraulic, potential energy, kinetic energy
Permit Holder:	May be the Attendant. Attendant also authorized as gas tester.
Permit Issuer:	Designated person (Permit issuer/ competent person), who has a detailed knowledge of the plant, equipment and systems concerned, shall issue the Confined Space Permit to Work
Confined Space:	A Confined Space is an enclosed space, large enough and configured for a person (Entrant) to enter and has a reasonably foreseeable risk to workers of fire, explosion, and loss of consciousness, asphyxiation or drowning. It is not designed or suitable for continuing personnel occupancy and requires a permit to be allowed access. It may be small and restrictive for the Entrant, or it could be far larger such as an ore silo with hundreds of cubic metre capacity, but it is determined by the hazards associated with a set of specific circumstances and not just because work is performed in a small space. Entry into a confined space occurs when an Entrant's whole body or upper body and head is within the space. A confined space must have both of the following defining features: • Must be a space which is substantially (though not always entirely) enclosed. • One or more hazards must be present or reasonably foreseeable. A place not usually considered a confined space may become one if a change in the conditions inside or a change in the degree of enclosure or confinement, may occur intermittently. Conditions may be affected by the following examples: • Welding that may consume some of the oxygen. • A spray booth during spray painting. • Using chemicals for cleaning purposes which can add contaminants or fire risk.

Word / Phrase / Abbreviation	Definition
	In such cases the space must be defined as a Permit Confined Space. Some confined spaces may be created deliberately, for example reduced oxygen environments, where the oxygen level is depleted either by reducing the oxygen (hypoxic) concentration or increasing the concentration of another gas such as nitrogen. Hypoxic environments are used for instance, where fire prevention is required (such as paper archives) or delay oxidation in fresh food. Some spaces may meet the criteria to be classified a Permit Confined Space when they are used to store certain specific items, such as: • Storage of gas cylinders (carbon dioxide, argon, etc.) held in an enclosed space (which if discharged would affect the atmosphere sufficiently to represent a hazard). • A store of material used as part of a fire suppression system (which would represent a hazard if discharged). • A storage facility for wooden pallets used as fuel in heating systems. When a space is identified as a Permit Confined Space the Regulations in the Protocols apply in full, even where the risks are controlled. The status of a space can change depending on circumstance as can the risks, for example heavy rain may present a foreseeable risk of drowning or fine ore dust falls may cause asphyxiation in a space not usually considered confined. The space may be defined as a confined space because of the work being carried out in it and may cease to be a confined space when the hazard(s) is(are) removed and the atmosphere tested as safe, e.g., the space may cease to be confined when the fumes have been removed by ventilation. Actions taken to mitigate a risk should be monitored to ensure they are working effectively and continue to do so throughout the task. Figure 1 below can help the risk assessor with the decision-making process. It describes the hazards and specific risks – there must be at least one of these present or reasonably foreseeable to make any enclosed space a Permit Confined Space in which the Regulations apply.

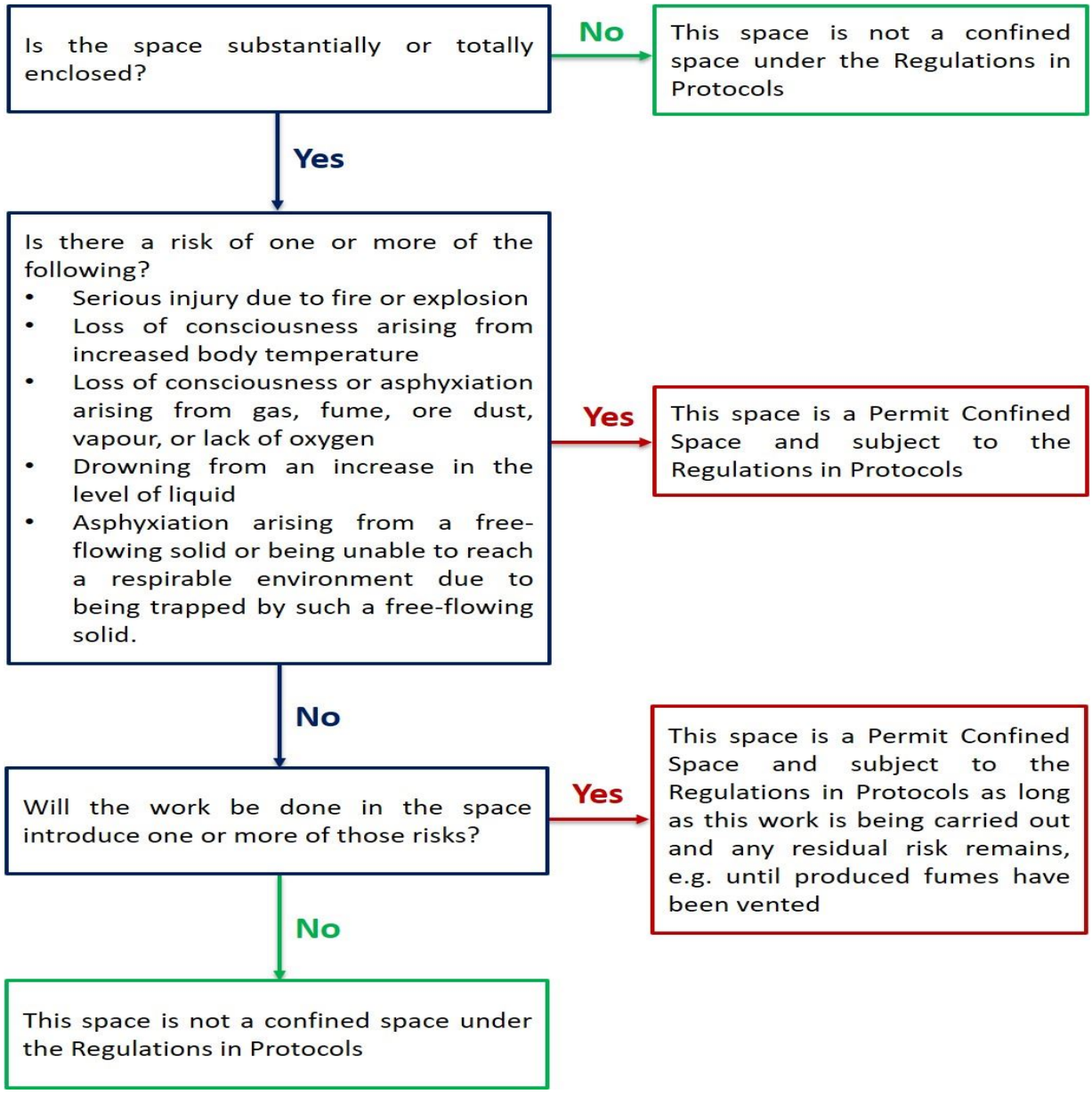


Figure 1: Confined Space Assessment

1 PURPOSE

This procedure provides common parameters in relation to working within Confined Spaces. This procedure is intended to provide safety guidelines for the personal protection of individuals when used in conjunction with the appropriate Safe Work Instructions for the task at hand.

2 SCOPE

This procedure applies to all Black Mountain operations, including new acquisitions, admin/corporate offices and research facilities located off site; during exploration, through all development phases and construction, operation to closure and, where applicable, for post closure management.

3 STANDARDS AND RULES

- Mine Health and Safety Act
- Mine Health and Safety Act Regulations
- Occupational Health and Safety Act
- Vedanta Critical Control Standards

4 PROTOCOLS AND REGULATIONS

- Mine Health and Safety Act 29 of 1996
- Occupational Health and Safety Act of 1993
- General Safety Regulations of 1993
- Construction Regulations of 2014
- Vedanta Critical Control Standards

5 IMPLEMENTATION OF SOP

- Integration with BMM SHE Policy, promulgation of SOP and communication.
- Quantity survey and costing of controls.
- Procurement of Signage and Barriers.
- Procurement of Gas Detection and Monitoring equipment.
- Procurement of Ventilation equipment.
- Procurement of Access, Egress & Extrication equipment
- Procurement of Respiratory Rescue and resuscitation equipment.

- Medical Fitness Evaluations appropriate to confined spaces.
- Training of Entry Supervisors, Attendants, Entrants and Rescuers.
- Standardisation of SOP to include Contractors.

6 MONITORING OF SOP

- Enforcement of SOP.
- Planned Task Observations.
- Inspection, Service, Maintenance & Re-Certification of equipment.
- Refresher training.
- Standardisation of SOP to include Contractors.

7 REVIEW OF SOP

- SOP must be reviewed not exceeding 2 years.
- When legislation changes.
- When more advanced controls are available.
- After an incident.
- After changes to risk activity areas.
- After changes in the process (plant).
- Changes in the risk profile.

8 CONFINED SPACE HAZARDS

- The hazards in confined spaces arise through the combination of the confined nature of the place of work and the possible presence of substances or conditions which, taken together, can increase the risk to safety or health. Hazards can exist in the space (e.g., fumes or flammable atmosphere) or they can be introduced to a substantially enclosed space that otherwise would be safe (e.g., fumes released when using chemical cleaners). The most likely hazards are as follows:

FLAMMABLE SUBSTANCES AND OXYGEN ENRICHMENT

- A risk of fire or explosion can arise:
- From the presence of flammable substances, for example from fumes left in a tanker previously used for transporting petrol.
- From an excess of oxygen in the atmosphere, for example caused by a leak from an oxygen cylinder forming part of welding equipment.

- From the presence of chemicals that can combust or spark in enriched (or in some cases normal) oxygen levels.
- From the ignition of airborne flammable contaminants such as flour dust.
- Due to leaks from adjoining plant or processes that have not been effectively isolated.

EXCESSIVE HEAT

- Hot conditions can lead to a dangerous rise in core body temperature, and this can be made worse by wearing PPE, highly physical and strenuous work, or working at a high work rate. The Black Mountain Mining operation is situated in a hot climate area which significantly increases temperatures in confined spaces.
- In extreme cases heat stroke, it can result in unconsciousness excessive heat can occur where:
- Work is being done in hot conditions or where, for example, boilers or furnaces have not been allowed sufficient time to cool before entering to undertake maintenance, re-fitment, cleaning, or inspection work.
- The confined space is exposed to the sun or other heat source (e.g., furnaces).
- Equipment has been steam cleaned to remove hydrocarbons.
- Hot work is being carried out, e.g., using welding equipment for repair.
- A slower heat build-up in the body can also cause heat stress. If action is not taken to cool the body, there is a risk of heat stroke and unconsciousness.

POOR AIR QUALITY FROM TOXIC GAS, FUME OR VAPOUR

Toxic gas, poisons, fine dust, fume, or vapour can lead to asphyxia, unconsciousness and ultimately death. These contaminants can occur due to:

- Ore dust deposits caused by ordinary plant processing operations.
- Previous processing or storage in the space, e.g., fumigation or decaying material.
- Sludge or other deposits, for example when disturbed by cleaning. Hydrocarbon vapour can still be present under scale even after cleaning.
- Entering the space from an adjoining plant that has not been effectively isolated or from exhausts of equipment being used, e.g., generators for lighting.
- Welding work.
- Lead lining.
- Brush and spray painting, or moulding using glass-reinforced plastics.
- Use of adhesives or solvents.
- From the products of combustion.

- Plant failure, e.g., build-up of ammonia if refrigeration plant fails or accumulation of carbon dioxide following leaks from compressed gas cylinders.
- Naturally occurring biological processes producing toxic gases in sewers, storage tanks, storm water drains, wells, slurry pits, etc. or produced because of fermentation in sealed silos where crops are stored.
- Build-up in some spaces, such as sewers or manholes, due to contaminated ground or leaks from behind vessel linings, rubber, lead, brick, etc.
- Actions outside the space, for example due to hot work (welding on the exterior surfaces) or from equipment outside the space (such as exhaust fume) from outside the plant, especially on construction sites, petrol-driven pumps, ventilation equipment or generators being used to provide light within the confined space.
- Volatile Organic Compounds (VOC's) may be present in some confined spaces, especially where cleaning or painting was performed. VOC's cause eye, nose and throat irritation, frequent headaches, nausea, and can also damage the liver, kidney, and central nervous system. Examples of VOC's are gasoline, benzene, formaldehyde, solvents such as toluene and xylene, styrene, and perchloroethylene (or tetrachloroethylene), the main solvent used in dry cleaning.

OXYGEN DEFICIENCY AND ASPHYXIANTS

Hazards from asphyxiants – Simple asphyxiants are gases which can become so concentrated that they displace oxygen in the air (normally about 21%). Asphyxiants include argon, nitrogen, or carbon monoxide.

A lack of oxygen in the atmosphere may also lead to asphyxia or unconsciousness. Oxygen deficiency can result from any processes and storage of many different products, including:

- Purging the confined space with an inert gas to remove flammable or toxic gas, fume, vapour, or aerosols.
- Naturally occurring biological or chemical processes consuming oxygen, for example:
- In fermentation vessels during brewing.
- In cargo holds from the carriage of timber or timber products.
- From steel turnings, swarf, or scrap metal.
- From vegetable products, grain, or coal, etc.
- The transport or storage of wood pellets used as biofuel, which under certain circumstances can both consume oxygen and produce carbon monoxide gas.
- Leaving a vessel completely closed or poorly ventilated for some time (particularly one constructed of or containing items made from steel) since the process of rust formation on the inside surface consumes oxygen. Newly fabricated or shot-blasted

carbon steel vessels are especially vulnerable to rusting, particularly those with a large surface area such as heat exchangers, separators, filters, etc.

- Increased levels of carbon dioxide from limestone chippings associated with drainage operations when it gets wet.
- Burning operations and work such as torch cutting, welding, and grinding which consume oxygen.
- Displacement of air during pipe freezing, for example with liquid nitrogen.
- A gradual depletion of oxygen as workers breathes in confined spaces and where provision of replacement air is inadequate, particularly where the work is strenuous, or the rate of breathing is increased due to the ambient temperature in the space. Both heat and cold can cause changes in a person's respiration rate. Anxiety caused by claustrophobia, acrophobia or entrapment can also increase the rate of breathing.
- A deliberate reduction in the oxygen level, designed to inhibit fire (e.g., in archives, IT server rooms, electricity sub-stations, etc.) or to reduce the effects of oxidation.
- CARBON MONOXIDE (CO) EXPOSURE
    - Colourless and odourless.
    - Produced from the incomplete burning of carbon containing material, i.e., gasoline, wood, natural gas, etc.
    - Similar in weight as air, therefore evenly distributed in a confined space.
    - CO is an asphyxiant preventing body from absorbing oxygen causing suffocation (lethal at doses of <1%).
- HYDROGEN SULPHIDE (H_2S) EXPOSURE
    - Has odour like rotten eggs.
    - Enters confined spaces through sewers, from rotting material, industrial processing by-products, chemical leaks, and spills, etc.
    - Heavier than air.
    - Flammable like methane and can ignite a large area.
    - Exposure can neutralise a victim's sense of smell, but higher concentrations can cause death in seconds.
- SULPHUR DIOXIDE (SO_2) EXPOSURE
    - Has a pungent, irritating odour, like that of a struck match.
    - Colourless in appearance.
    - Used as preservative of fruit and has anti-microbial properties and prevents rotting of fruit.

- A gas primarily emitted from fossil fuel combustion at power plants and similar industrial facilities, as well as fuel combustion in mobile sources such as locomotives, ships, etc.
- Very toxic and can cause death - Symptoms are severe irritations of the nose and throat, and high concentrations can high concentrations can cause a life-threatening accumulation of fluid in the lungs.

9 THE INGRESS OR PRESENCE OF FLUIDS

Liquids can flow into the confined space and lead to drowning, for example the ingress of liquid when working in sewers or from other plant which has not been adequately isolated in an industrial situation. The presence of a liquid can also lead to other serious injury or health effect depending on the nature of the liquid, such as its corrosivity (acids such as sulphuric acid or bases such as ammonium hydroxide) or toxicity (which can release toxic gases into the air). Drowning can occur in even a small depth of fluid (pool), especially when unconscious on the floor.

10 SOLID MATERIALS WHICH CAN FLOW

Free-flowing solids can submerge a person, preventing breathing. Materials which create this hazard include grain, flour, ore dust and other substances in granular or powder form. In a confined space the risk of engulfment is increased because there is no space for the material to flow away. Even if the worker's head is above the solid material, pressure on the chest and lungs can stop breathing or cause injuries to internal organs.

11 WORKING AT HEIGHTS AND ENTRAPMENT

- Access into confined spaces is often performed from elevated positions where a fall could take place to the bottom or into structures. Such falls can create a myriad of health & safety issues, including the difficulty of an emergency rescue, but the most common risk being suffering blunt force trauma from collision with objects, structures and the floor / ground.
- The psychological impact on an Entrant can be profound in that his/her fear of confined spaces (claustrophobia) may manifest when trapped (stuck or wedged between structures or inward converging or tapered walls). Steel frameworks, funnelled chutes and scaffolding are typical structures which may cause entrapment and difficulty of escape, extrication, or rescue.

12 FALL OF ORE DUST

- Many of the confined spaces in the concentrator plant and silo area require cleaning and loosening of ore dust from a lower position, working above the Entrant's head, which may cause a fall of ore and heavy dust onto the Entrant.

13 BIOLOGICAL HAZARDS

- Sources of biological hazards may include bacteria, viruses, insects, fungi, algae, arachnids, snakes, plants, birds, animals, and humans. These sources can cause a variety of health effects ranging from skin irritation, allergies, infections and bites / stings from venomous arachnids, reptiles and insects. The Pella Pump manhole is a typical example of a confined space with possible biological hazards where access is infrequent and conditions ideal for nesting of fauna and undisturbed growth of fungi and algae.

14 ERGONOMIC HAZARDS

- Working in confined spaces, especially where there are risks of slips, falls or unstable surfaces, Entrants are exposed to ergonomic hazards where injuries to the musculoskeletal system may occur. This is caused mostly by uncomfortable work positions, repetitive movements, poor body positioning, and manual handling of heavy objects such as tools, grinders, welding equipment, liners and tiles. To avoid a slip or fall, Entrants would usually hold onto the nearest structure whilst performing duties, often in an ergonomically incorrect manner.

15 CHEMICAL EXPOSURE

- Chemical exposures due to skin contact or ingestion as well as inhalation of 'bad' air. Process-related hazards such as residual chemicals, release of contents of a supply line.

16 SPECIFIC RISKS

No.	Hazards	Risks
1.	Flammable substances and oxygen enrichment	Serious injuries or death to Entrants from fire or explosion.
2.	Excessive heat	Heat stress, loss of concentration, heat stroke and unconsciousness.
3.	Poor air quality from toxic gas, fume or vapour	Asphyxia / suffocation, unconsciousness and ultimately death.
4.	Oxygen deficiency	Continued oxygen deprivation results in fainting, long-term loss of consciousness, coma, seizures, asphyxia, cessation of brain stem reflexes, and brain death. Low oxygen levels (19.5% or less) can cause

		symptoms such as rapid breathing, rapid heart rate, clumsiness, emotional upset, and fatigue. As less oxygen becomes available, nausea and vomiting, inability to escape, collapse, convulsions, coma and death can occur. Unconsciousness or death could result within minutes following exposure to a simple asphyxiant.
5.	The ingress or presence of fluids	Death from drowning.
6.	Solid materials which can flow	Engulfment, asphyxia / suffocation, unconsciousness and ultimately death.
7.	Working at heights and entrapment	Falls / collision with structures / blunt force trauma, psychological trauma, major bodily and head injuries, loss of consciousness, death. Entrapment: Asphyxiation. Musculoskeletal disorders or personal injury from attempts by an Entrant for free him/herself. It further triggers or aggravates claustrophobia which may lead to anxiety and ultimately unconsciousness.
8.	Fall of ore dust	Blunt force trauma, engulfment, asphyxia, death.
9.	Biological hazards	Contraction of infections, non-infectious poisoning, infectious diseases and viruses. Envenomation from bites from arachnids, some insects and snakes.
10.	Ergonomic hazards	Musculoskeletal disorders such as injuries or pain in the musculoskeletal system, including the joints, ligaments, muscles, nerves, tendons, and structures that support limbs, neck and back.
11.	Chemical exposure	Skin irritants, carcinogens or respiratory sensitizers can have an adverse effect on an Entrant's health as a result of direct contact with or exposure to the chemical,

		usually through inhalation, skin contact or ingestion.

17 MINIMUM STANDARD ENTRY CONTROLS

Risk control measures will be determined with regard to the outcomes of the risk assessment. Implementing the most effective control measures shall follow the principles of the hierarchy control. This process is where the most effective control is implemented, beginning with eliminating the need for persons to enter the confined space wherever possible.

- **Elimination** - Eliminate the need to enter the confined space.
- **Substitution** - Substituting the application or substance for something less hazardous.
- **Isolation/Engineering -** Positive isolation and lockout measures, setting up barriers and establishing effective ventilation systems.
- **Administrative -** Use of an entry permits procedure, appropriate training, safety signage and a stand-by person.
- **PPE -** Ensure PPE is provided and used.

CONTROLLING UNAUTHORISED ENTRY

- Confined spaces must be closed, locked, or cordoned off effectively to avoid accidental entry.
- Clear signage must be displayed conspicuously at confined space entrances warning that it is a Permit Confined Space requiring a permit to enter, and other warning signs of identified major hazards, i.e., working at heights, ore dust / engulfment, drowning, toxic and / or flammable gases and / or substances, etc.

PRE-ENTRY HAZARD IDENTIFICATION AND ATMOSPHERIC TEST

- Identify physical hazards in permit space.
- Test atmosphere by using a Remote-Controlled Multi-Gas Detection Instrument to detect and measure flammable gases, vapours and oxygen levels.
- Oxygen level must be between 19.5% (minimum) and 23.5% (maximum).
- Flammable gases / vapours must be less than 10% of Lower Explosive Limit (LEL).
- All substance levels must be below established Permissible Exposure Limit (PEL).
- Atmospheric hazards are often heavier or lighter than air. This causes stratification (top level may be clear of hazards while heavier gases are present at the bottom) and therefore testing must be done at three levels inside the confined space (top, middle and bottom).
- Testing must also be done at openings.

18 ATTENDANT, COMMUNICATIONS AND EARLY WARNING SYSTEM

- Appoint outside watchman (Attendant) – trained and equipped to perform CPR, to make alarm, and maintain communications & direct eyesight (where possible) with workers inside confined space.
- Review and test communications devices and procedures between Attendant and Entrants inside the confined space.
- Use a Personal Distress Alert Device in hazardous circumstances between Entrant inside confined space and Attendant to monitor health and welfare of Entrant.
- Horn for alarm.

19 LIGHTING EQUIPMENT

- Entrant(s) and Attendant must wear an Intrinsically Safe Head Lamp and / or Intrinsically Safe Lighting Equipment must be provided to provide good lighting inside the confined space.

20 BARRIERS, SHIELDS, AND SIGNS WHILST IN CONFINED SPACE

- Place signs, barriers and shields at entrance of permit confined spaces warning of confined space work in progress and to protect Entrants from external hazards.

21 FORCED ATMOSPHERIC VENTILATION (PURGING)

- Unsafe levels of contaminants, which have been identified by testing the atmosphere, must be reduced to a safe level before entry.
- Cleaning methods such as hydro jetting, steam cleaning, abrasive blasting and chemical cleaning will depend on the size and type of the confined space.
- Purging with inert gases may be required to displace a specific contaminate from a confined space.
- Drain, clean and ventilate (purge) the confined space with fresh air to displace atmospheric hazards by using a Portable Ventilation Fan and Flexible Ducting. Axial Fans may also be used if it can be mounted to blow air directly into the opening(s) of the confined space.
- Caution must be taken when working in ore dust bins and chutes, not to disturb dust. It would be better to use respirators or dust masks under these circumstances as strong air flow may cause unnecessary dust disturbance.
- An indication of the estimated time it takes for purging can be calculated: (confined) space area Ø x Length = m^3. Time to turn air over once = Confined Space m^3 x m^3 Fan Rate per minute =? Minutes. However due to variables, it can be assumed that it will take longer.

- Thus, cleaning and purging must be carried out from outside the confined space and continued until the risk of the contaminants has been reduced to a safe level i.e. oxygen levels between 19.5% and 23.5%, and flammable gases must be less than 10%.
- Correct ducting ensures proper ventilation and should therefore be adjusted to suit each type of confined space. Too short ducting will result in short air circulation and some parts of the confined space not ventilated. Long ducting is more effective, but caution must be taken not to create re-circulation.
- An additional opening in the confined space will provide increased displacement of atmospheric gases through forced ventilation.
- E-Ducting (vacuum venting) must be avoided for initial purging in large confined spaces as it may draw out toxic gases from other and further areas into the confined space area.

22 MONITORING THE ATMOSPHERE

- The atmosphere must continuously be monitored to check ambient values of flammable gases, vapours, and oxygen in the atmosphere in the confined space.
- The Zone Multi-Gas Monitor or Personal Gas Detection Monitor may be used.
- An early warning system is required to warn Entrants and Attendants in sufficient time to exit from the confined space.
- If the air quality changes, especially if oxygen drops to below 19.5%, either purging must be done, or respiratory PPE must be used. If the air quality is too hazardous, Entrants must leave the confined space immediately.

23 HOT WORK PROCEDURES

- All flammable gases, liquids and vapours must be removed before the start of any hot work (where a flame is used, or a source of ignition may be produced).
- Use Mechanical Ventilation to keep the concentration of any explosive or flammable hazardous substance less than 10% of its Lower Explosive Limit.
- Make sure that the oxygen content in the confined space is not enriched. Oxygen content should be less than 23.5% but maintained at levels greater than 19.5%.
- Surfaces coated with combustible material should be cleaned or shielded to prevent ignition.
- Fuel containers are prohibited into the confined space (e.g. gasoline, propane).
- Ensure welding equipment is in good condition.
- Where appropriate, use spark-resistant tools, and make sure all equipment is bonded or grounded properly.

- While doing the hot work, the concentrations of oxygen and combustible materials must be monitored to make certain that the oxygen levels remain in the proper range and the levels of the combustible materials do not get higher than 10% of the Lower Explosive Limit. In special cases it may not be possible, and additional precautions must be taken to ensure the safety of the worker prior to entering the confined space.
- Fire extinguisher(s) must be available at entrance.
- If work produces fumes, E-Ducting the confined space is more effective than positive displacement. E-Ducting is the reverse effect from switching the Portable Ventilation Fan to extract / suck air from the confined space instead of blowing into it.

24 PERSONAL PROTECTIVE EQUIPMENT

- Entrants and Attendants must wear comfortable Industrial Climbing Helmets with sweat bands and textile harness liners. Reflective strips will make the Entrant and Attendant more visible.
- Particles or fumes falling into eyes may cause discomfort, burns or temporary blindness in the confined space, which will add to the variety of health & safety risks. Wrap-around Anti-Mist Eye Protection is required and in dusty or windy environments, Eye Goggles must be worn.
- In dusty confined spaces, appropriate Dust Masks must be worn (correctly).
- Where gases, fumes and toxins remain in acceptable low levels after purging, Half- or Full-Face Masks or Respirators must be used with appropriate contaminant specific Filters.
- In low oxygen confined spaces, Air Fed / Self Contained Breathing Apparatus must be used (SCBA).
- Overalls and other Protective Clothing must be made from cotton or flame-resistant fabric with reflective stripes and cover the torso, arms and legs completely.
- Where hot surfaces may exist, appropriate Leather Gloves are required.

25 EQUIPMENT FOR SAFE ACCESS & EGRESS

HORIZONTAL ACCESS WITH NO RISK OF A FALL

- For horizontal access, use Guideline (Rope Grab FAS) connected to the Entrant's Safety Harness, ending outside the confined space.

26 HORIZONTAL OR VERTICAL ACCESS WHERE THERE IS A RISK OF A FALL TO A LOWER LEVEL

- Mechanical Man-Riding and Fall Arrest & Recovery Devices must be used in conjunction with Portable Anchors (Tripod or Davit System).
- The Mechanical Man-Riding Winch provides for man-riding where ladders cannot be used and for extrication of an injured or unconscious casualty, without having the Attendant enter the confined space. The mechanical advantage should be at least 1:6.
- The Mechanical Fall Arrest & Recovery Device is used to protect the Entrant against falls for access where structures and ladders can be used for access. It is fitted with a winch for recovery, but only on a much lower mechanical advantage making it unsuitable to be used as a man-riding winch, therefore only as a means to recover from a fall.
- The Tripod System is used to access vertical manholes and vessels where there is a risk of a fall, either from a ladder or when an Entrant must be lowered into or hoisted out of the confined space.
- The Davit System is used to access vertical confined spaces from a short distance from the edge of the entry / exit point, operating similar to a crane. The Davit Arm base is designed to swivel to allow an Entrant to connect the system whilst being a safe distance from the edge.
- Both the Tripod and Davit Systems are portable and can be secured and used in any vertical confined space access position respectively.
- It is important to note that uneven or rounded surfaces may cause instability for a Tripod, in which event the Davit should be used.

DAVIT AND TRIPOD SYSTEMS

- Connection to either the Davit or Tripod mechanical devices must be done simultaneously.
- Davit fixing positions must be strategically where it’s not too close to the edge but and not too far from the edge to protect wire rope against friction. There are various methods of connection by selecting appropriate Davit Base Anchors

FLANGE CLAMP ACCESS & EXTRICATION SYSTEM

- Used where access is through a horizontal manhole and where a sudden drop to a lower part of the confined space will cause a fall and possible entrapment.
- The Flange Clamp Access & Extrication System (FCAES) consists of an Anchor Clamp which fits onto the flange, an extension beams inside the confined space, a Fall Arrest & Recovery Device fitted to the Anchor Clamp, outside the entry position and pre-fitted pulleys to provide a fall arrester with man-riding facility.
- The FCAES is pre-fitted to the manhole flange and the Entrant must connect to the Fall Arrest & Recovery Device, prior to entry.

- In ‘fall arrest mode’, the FCAES will protect the Entrant against a fall by locking the brake pawls in the Fall Arrest & Recovery Device. The Attendant must engage the ‘man-riding mode’ to recover the Entrant to a point of safety. If a lower hatch is open in the confined space, and it is safe to do so, the Attendant can lower the Entrant to safety at a lower position through the lower hatch. All hazards at lower level (i.e., entrapment, atmospheric hazards and liquids, etc.) and outside the confined space must be considered before lowering an Entrant through a lower hatch. The Emergency Response Team will have to extricate an injured or unconscious Entrant.
- When used in ‘man-riding mode’ as a means of access (without any ladder or foothold), the Entrant must wear a 4PR Confined Space Suspension Harness which is designed for comfort for longer periods of suspension.
- Where a ladder cannot be used, the Entrant must be lowered and raised by engaging the Man-Riding function on the Fall Arrest & Recovery Device
- When a ladder or other means of access is available for the Entrant, the Attendant must select the Fall Arrest function on the Fall Arrest & Recovery Device, and in the event of a fall, re-engage the Man-Riding function to either raise or lower the Entrant to get a foothold on the ladder or to the next level to stand on.

PERSONAL FALL PROTECTION

- The Attendant is required to protect him/herself for falls and if there is a risk of a fall, be connected to either the Tripod, Davit or any other strong anchorage at least 1m away from the access / exit of the confined space. The most practical, yet effective connecting element is a short (low fall impact) Inert Reel Fall Arrest Block which will provide total freedom of movement to assist the Entrant but will arrest any potential fall at a short distance.
- Harnesses must be chosen for the purpose intended. The 2PR Confined Space Harness is suitable as a lightweight general use harness, which features a chest and shoulder overhead strop with link. For fall arrest purposes, i.e. where ladders or structures are used for access and egress in vertical confined spaces, the shoulder overhead link or, if fitted, dorsal link must be used. The 2PR must NOT be used for suspension purposes (man-riding) as prolonged suspension in this harness may result in groin pains and suspension trauma.
- The 2PR Confined Space Harness shoulder overhead strap must also be used for the Guide Rope attachment when entering horizontal confined spaces where there is no risk of a fall.
- The 4PR Confined Space Suspension Harness is used where an entrant is lowered and hoisted in and out of a vertical confined space where no means of safe access is provided. The 4PR offers a ‘sitting’ facility for comfort whilst in airborne transit. 4PR is suitable for longer term suspension if connection to the Man-Riding Winch is to the groin link. It is recommended that the Fall Arrest & Recovery Device is used

as a back-up fall arrester connected to the shoulder overhead link simultaneous to the Man-Riding Winch.

27 MEDICAL & PSYCHOLOGICAL FITNESS EVALUATIONS

- Working in confined spaces is stressful and require a high level of physical and mental fitness, especially in emergency situations, and therefore Entrants and Emergency Response Teams must be tested and declared fit to enter confined spaces by an Occupational Medical Practitioner (OMP) as follows:

PERIODIC MEDICAL ASSESSMENT

The guidelines regarding the interval of assessment will be suitable for most employees. However, the frequency of assessments in any individual case is at the discretion of the OMP.

TESTS CARRIED OUT MUST INCLUDE:

- Spirometry.
- Ishihara Color Vision Test.
- Keystone Vision Test.
- Audiometry.
- Blood Pressure and pulse measurement.
- Urinalysis.
- Body Mass Index measurement (BMI=Weight / (Height 2) kg/m2.

The OMP must then conduct a clinical assessment using these findings and decide on Fitness to Work using the following criteria:

- **Age** - Employees will generally be in the age range of 18-55 years. This can be extended if the employee is deemed fit at the discretion of the OMP.
- **Height -** Generally should be in the height range of 1.6 – 1.93 m. This can be extended at the discretion of the OMP.
- **Body Mass index** - BMI, below 35 but can be extended at discretion of OMP. An existing confined space worker who exceeds the acceptable BMI may be temporarily suspended from confined space work until weight reduction has brought the BMI down to within acceptable limits. In the case of body builders or active weightlifters, individual concern will be given and assessed on an individual basis.
- **Cardiovascular disease** - Blood Pressure should be below the following levels, dependent on age:
- **Under 40 years** = 155 / 95 mmHg; 40 – 49 years = 165 / 100 mmHg; 50+ years = 170 / 100 mmHg.

- Most cardiovascular disorders are incompatible with the demands of confined space work. Hypertension controlled by treatment is acceptable provided that there are no adverse side effects that could interfere with confined space work. Peripheral vascular disease is a contraindication to confined space work. Varicose veins may be acceptable, at the discretion of the OMP. In general, small, isolated varicosities are acceptable, whilst extensive disease, particularly associated with varicose eczema would not be. Ulceration is a contraindication to work.
- **Respiratory system** - The majority of respiratory disease is incompatible with confined space work and the use of breathing apparatus. Acute disorders or infections may result in temporary suspension pending recovery, subject to attainment of normal spirometry and fitness results after recovery.
- **Vision** - Visual acuity (with correction if required) must be 6/9 with both eyes open. The employee must be able to read N12 at 30 cm (with correction if required) with both eyes open. Color vision should be tested with Ishihara plates and 2 or less errors will pass. More than 2 errors may be referred for further testing at discretion of OMP. Significant eye disease, e.g. glaucoma, retinal detachment, is incompatible with confined space work.
- **Hearing -** Hearing loss must not exceed 40dB at any frequency below 8kHz. Categories 1, 2, and 3 are excluded. Significant ear, nose or throat disease is a contraindication to confined space work. Hearing aids are not permitted.
- **Speech** - Normal speech with the ability to shout and project the voice is essential. A tendency to recurrent or chronic laryngitis is a contra indication to work. Stammering speech is not allowed and the examiner must enquire as to whether the employee has a tendency to stammer under stress.
- **Locomotor System** - Adequate strength of limbs and the spine is essential for normal work. Joint movements and general mobility / flexibility must be adequate for normal work. Any disability must be so slight that it does not interfere with the ability to handle tools, perform heavy manual work, wear a breathing apparatus, climb ladders, or perform adequately under conditions expected.
- **Mental capability / emotional stability** - The ability to perform under stress and cope adequately under operational conditions is essential. Significant anxiety, claustrophobia, acrophobia or psychotic illness are contraindications to confined space work. A past history of significant mental illness is a contraindication to confined space work which includes anxiety, psychosis or psychopathic tendency. Any evidence of alcohol, drug or substance abuse is a contraindication.
- **Medication** - Acute medication requirements must be assessed for side-effects that may impair judgement or reaction times. The underlying condition requiring medication must also be assessed for compatibility with normal duties. Chronic medication is undesirable but may be compatible with normal duties depending on the disease state requiring treatment.

- **Disease** - HIV infection is a contraindication to confined space work. Control of diabetes by diet, or diet and Metformin tablets is compatible with confined space work. However, there must be no significant complications of diabetes. Diabetes requiring treatment with insulin is a contraindication for confined space work.
- **Neurological disorders** - A history of epilepsy or fits are both contra indications to confined space work. Diseases producing vertigo or loss of balance, coordination, power, flexibility, consciousness, speech or mobility are contraindications to confined space work.
- **Skin Disorders** - Chronic or suppurative skin diseases are contraindicated to confined space work. Acute skin disorders may result in temporary suspension from confined space work.

EXAMINATION AFTER SICKNESS, ACCIDENT, OR INCAPACITY

- Examination by the OMP must be carried out before resuming confined space work in relation to the following episodes:
- Sickness exceeding three weeks.
- Absence certified as, or believed to be, due to a psychiatric condition.
- Any episode of convulsion, loss of consciousness, disturbance of consciousness, or dizziness.
- Any episode of visual disturbance.
- Prescription of long-term medication $>$ 4 weeks.
- Any absence certified as, or believed to be, due to cardiac, nervous system disease or diabetes.
- Any other circumstances or medical condition, which in the opinion of the Manager or Employee might result in a risk to safety.

EXAMINATION AFTER INCIDENTS

- A medical assessment should be requested after any significant operating incident where there is reason to believe that the physical or mental health of the Employee might have been:
- A contributory factor to the incident.
- Adversely affected by the incident.

BEFORE PERMIT TO ACCESS CONFINED SPACE IS ISSUED

- No person shall be allowed to access a permit confined space without a medical certificate issued by an OMP.

- Entrants and Attendants must always be hydrated by drinking fluids regularly. Adequate supplies of rehydrating supplements must be made available. Workers must also take regular breaks to rest.
- Entrants and Attendants must be tested for alcohol and must also declare if using medication causing drowsiness. For high-risk work with serious consequences, drug tests should be done.

DEFINITION: CONTRAINDICATION

- Contraindication means that event or substance could cause a life-threatening situation. A procedure or medicine that falls under this category must be avoided.

28 TRAINING AND COMPETENCE

ENTRY SUPERVISORS, ATTENDANTS, AUTHORISED ENTRANTS, AND THE EMERGENCY RESPONSE TEAM MUST FULLY UNDERSTAND:

- The signs, symptoms, and resulting dangers / risks of hazards in confined spaces.
- How to do a complete Confined Space Risk Assessment & Entry Permit.
- Procedures for entry into confined spaces.
- How to communicate with each other during occupancy of permit space as well as rescue procedures.
- How to be safe in a confined space by understanding and executing the controls of the Minimum Standard Entry Controls, including self-rescue & evacuation.
- The process and information required for a Confined Space Entry Permit.

TRAINING MUST BE PROVIDED BEFORE:

- Assigning duties to workers pertaining to permit confined spaces.
- Before changing workers' duties.
- When procedures change for permit confined spaces.
- When it becomes evident that the employee needs further training.
- The due date for refresher training.

THE ATTENDANT AND EMERGENCY RESCUE TEAM MUST ALSO BE TRAINED IN THE FOLLOWING TASKS:

- To manage Entrants and all activities of confined space entry.
- To administer first aid and resuscitation using appropriate equipment.
- To manage an emergency involving Entrants in a permit confined space.

THE EMERGENCY RESPONSE TEAM MUST BE TRAINED AND CERTIFIED TO PERFORM THE FOLLOWING TASKS EFFICIENTLY:

- Manage a confined space rescue.
- Use a Self-Contained Breathing Apparatus in a confined space.
- Administer first responder first aid to a Casualty.
- Extricate a Casualty from a confined space using Extrication Equipment and appropriate Stretchers.
- All persons involved with confined spaces must be competent as per the definition: A person who has, through a combination of training, education and experience, acquired knowledge and skills enabling that person to perform correctly a specified task. Competence is paramount when working, supervising or managing fatal risks such as working at heights and accessing confined spaces or performing emergency rescues.

29 BEHAVIOUR BASED OBSERVATIONS

- Any poor behaviour inside or near confined spaces which may affect the safety of both the Entrant(s) or Attendant, must be addressed as soon as it is reported or witnessed. Contractors must also adhere to good working practices as poor behaviour may cause an accident on site.
- Typical behavioural traits to be aware of when working in confined spaces are:
- Interference with health and safety facilities.
- Being untruthful about medical conditions which may deem the worker unfit to work in confined spaces.
- Not using equipment properly.
- Refusal to use issued equipment.
- Using equipment for other purposes than for the purpose intended.
- Nonchalant attitudes towards safety.
- Horse-playing with equipment.
- Vandalising safety equipment (this is a crime).
- Pranks on co-workers.
- Lacking co-operation.
- Failing to leave the risk activity area (working place) if deemed unsafe to continue work or when ordered to do so by an Attendant.

- Behavioural based observations can be performed by any Attendant, Permit Supervisor or Manager.

30 PROCEDURES FOR INSPECTION, TESTING AND MAINTENANCE OF EQUIPMENT

- Equipment used in permit confined spaces for personal protection must be kept in perfect working order for optimum performance as would be expected by users. The following procedures provide basic guidelines to maintain and appreciate equipment used in permit confined spaces.

MOBILE GAS MEASUREMENT / FIXED GAS SYSTEMS.

- Before use visual check and testing (users).
- Annual calibration and service (certified OEM inspector).

SELF-CONTAINED BREATHING APPARATUS

- After use cylinder fill (filling point as OEM's recommendations).
- Before use visual inspection and test (users).
- Backplates and Masks: Annual inspection (certified OEM inspector).
- Masks: Ensure that it is not perished and seals on face.
- Cylinders: 2 Yearly visual inspection (SANAS accredited cylinder workshop).
- Cylinders: 4 Yearly visual and hydrostatic inspection (SANAS accredited cylinder workshop).

EMERGENCY ESCAPE BREATHING APPARATUS

- Annual inspection (certified OEM inspector).

PERSONAL DISTRESS ALERT DEVICE

- Before use visual inspection and test (users).
- Replace battery when required.

VENTILATION FANS AND DUCTING

- Before use visual inspection and test (users).
- Check for any loose parts or debris in the blower.

PERSONAL PROTECTIVE EQUIPMENT

- Before use visual tests and complete pre-use checklist (users).
- 3 Monthly inspections and testing (designated competent person).
- Helmets: Check that the shell is not deformed or cracked and that the suspension harness is in good condition.

- Goggles: Ensure lens is free of scratches, seals around eyes and anti-fog works.
- Respirators: Ensure that it is not perished and seals on face.
- Filters: Replace used filters.
- Safety Harnesses : Check for cuts, nicks, burns and damaged webbing and stitching. Also check that hardware is not corroded, buckles functional and not deformed.

TRIPOD & DAVIT SYSTEMS AND EXTRICATION EQUIPMENT

- Before use visual tests and complete pre-use checklist (users
- 3 Monthly inspections and testing (designated competent person).
- Annual inspection, testing and certification (certified OEM inspector).
- All components must be checked that it is complete.
- Components must be free of corrosion, cracks, deformations and damage.
- Mechanical fall arrest and man-riding devices must be free of corrosion and cracks.
- Wire rope must be free of corrosion and all strands intact.
- Winching mechanisms must operate effortlessly.
- Fall Arrest & Recovery Device must lock & release when tested for fall arrest.
- Pulleys must operate smoothly and be free of corrosion, deformations and cracks.
- All connectors must open and close properly and be free of corrosion, cracks and deformations.

RETIREMENT AND REPLACEMENT OF EQUIPMENT

- Faulty or missing components must be replaced.
- Equipment beyond economical repair must be destroyed and replaced.

APPRECIATION OF EQUIPMENT

- Equipment must be cleaned and stored as per the OEM's instructions in a cool, dry place sheltered from direct sunlight and sources of heat generation.
- Instruments must be locked in a safe place

31 INSPECTION RECORDS

- Inspection records must be kept on file for audits or incident investigations.

32 HOUSEKEEPING

- Pathways and the area around and inside the confined space entry point must be kept clear of objects which may cause slippage, tripping or obstruction.

33 DISTRACTIONS

- Apart from two-way radio contact between an Entrant and Attendant, no other means of communication such as mobile phones, or radios, music, etc. is allowed. Mobile phones are not allowed inside or outside confined spaces.

34 REPORTING

- Any unsafe practices inside or around confined spaces or contravention of the Regulations must be stopped and reported to the Attendant and/or Permit Supervisor.
- Any equipment appearing faulty must be reported to the Permit Supervisor and repaired or replaced.
- Any near misses or incidents must be reported to the Permit Supervisor.

35 WEATHER CONDITIONS

- Rain can wet and flood confined spaces which will increase the risk of drowning and slips; therefore, work must be avoided in confined spaces affected by rain.

36 WATER AND FLUIDS

- Working near or in water or fluids may cause drowning. If such work is unavoidable in confined spaces, the water must be drained or pumped out before entry is allowed.

37 LOCK-OUT AND ISOLATION

- Ensure that all energy sources are locked-out and/or isolated before entering a confined space, i.e., inflows, electricity, hydraulic, potential energy and kinetic energy.

38 AREA SPECIFIC CONFINED SPACE PROCEDURES

- The following procedures must be followed when work is conducted in the specific areas mentioned below, in addition to Minimum Standard Entry Controls:

FINE AND COARSE ORE SILOS

Working from the bottom

- Ensure that the silo is empty and declared safe by a competent responsible person.
- Ensure that the tripper car is isolated and locked-out at a silo other than the silo being worked on.
- Insert stop blocks on either side of the tripper car wheels.

- The top of the silo being worked in must be covered to avoid rocks falling into the silo.
- Ensure that a standby person with radio communication and a flashlight is posted at the top of the silo to stop the conveyor belt (pull cord) in the event of an emergency, blockage or to evacuate Entrants.
- If work is conducted whilst the relevant chute is attached to the silo, the secondary feed conveyor should also be isolated and locked out.

Working from the top

- Work is conducted by rope access technicians.
- Ensure that the tripper car is isolated and locked-out at a silo other than the silo being worked on.
- Insert stop blocks on either side of the tripper car wheels.
- Ensure that a standby person with radio communication and a flashlight is posted at the top of the silo to stop the conveyor belt (pull cord) in the event of an emergency, blockage or to evacuate Entrants.
- All persons working around the confined space must be connected to the structure or Temporary Safety Line to prevent a fall.
- If fall arrest methods are deployed, workers must always have effective Post Fall Arrest Rescue Equipment and a competent Rescuer on stand-by.

COARSE ORE TRIPPER CONVEYOR TAIL CHUTE

- Ensure that the chute is empty and safe.
- Ensure that block-chute detector is isolated and contact the control room to verify if the block chute detector is isolated.
- Ensure that the overland and the coarse ore tripper conveyor is isolated and locked out.

SCREEN FINES BINS

- Ensure that both DABMAR screens, screen feed and fine ore feed conveyors are isolated and locked out.
- Ensure that the bin is empty and safe.
- If a cutting torch is used, it is recommended that a fire blanked is placed on the fine-ore feed conveyor or let water run continuously over the fine ore feed conveyor. Caution must be taken to prevent water from pooling.

SCREEN FEED CONVEYOR TAIL CHUTE

- Ensure that the cross-over conveyor and discharge conveyor is isolated and locked out.
- Ensure that the chute is empty and safe.

Y-CHUTE

- Ensure that the chute is empty and safe.
- Ensure that the screen feed conveyor is isolated and locked out.
- When working in the upper part of the Y-chute a platform should be built inside the confined space by a competent person.
- When a leaning ladder or working platform is used, ensure the access equipment is properly positioned and secured.

SECONDARY CRUSHER BY-PASS CHUTE

- Make sure that the chute is empty and safe.

SURGE BINS

Working from the top

- Ensure that the bin is safe.
- Use a telescopic leaning ladder to enter the bin.

Working from the bottom

- Ensure that the bin is safe.
- Remove the crusher feed chute (long chute).
- A scaffold may be used to enter the bin but entrapment in the event of an emergency must be considered.

NB: No access to all Mills unless isolated and Locked out

ROD MILL

- Isolate and lock out the rod mill feed conveyor.
- Open the blower air at the feed hopper (if inserted/in position).
- Probe for gas detection and temperature readings.
- Oxygen levels should not be higher than 23.5% and lower than 19.5% before entering the mill and flammable gases should be less than 10%

BALL MILL

- Isolate and lock out Cyclone feed pump and valves
- Remove the feed hopper from the mill and ventilate the confined space for cooling by means of E-ducting (drawing hot air from confined space and not blowing).
- Probe for gas detection and temperature readings.
- Oxygen levels should not be higher than 23.5% and lower than 19.5% before entering the mill and flammable gases should be less than 10%

RE-GRIND MILLS

- Isolate and lock out feed pumps and valves
- Remove the feed pipe from the mill and ventilate the confined space for cooling by means of E-ducting (drawing hot air from confined space and not blowing).
- Probe for gas detection and temperature readings.
- Oxygen levels should not be higher than 23.5% and lower than 19.5% before entering the mill and flammable gases should be less than 10%

AERATION CELLS

- Drain the relevant aeration cell.
- Thoroughly wash out the aeration cell with water. Caution must be taken to prevent water from pooling.

ALL CONDITIONERS

- Drain the relevant conditioner.
- Thoroughly wash out the conditioner with water. Caution must be taken to prevent water from pooling.

ALL TANK CELLS

- Drain the relevant tank cell.
- Thoroughly wash out the tank cell with water. Caution must be taken to prevent water from pooling.

UNDERNEATH COPPER TAILS THICKENER

- Check function of the monitoring device on the outside of the thickener before entering.
- Ensure ventilation fan is running.

INSIDE ALL AIR RECEIVERS

- All repair work on or in air receivers must be outsourced to certified/competent contractors.
- Ensure the correct valves are isolated and locked out.

ACID TANKS

- All work to be conducted in the daytime.
- Drain excessive acid from the relevant tank.
- Fill the relevant tank up with water and allow 2 days standing time for dilution.
- Drain tank after 2 days.
- Open the manhole cover at the inside of the tank.

- Manually refill the tank up to the manhole level with water.
- Drain water again and allow another 2 days standing time.
- Insert an air pipe inside one of the manholes to allow for ongoing ventilation/purging (throughout duration of work in confined space).
- If there is a risk of drowning, the Entrant must use a Supplied Air Breathing Apparatus or suit.
- Make sure that the levels of the other acid tanks are not more than 80% full to capacity (throughout duration of work in confined space).
- Continuously test and monitor for flammable and toxic gases.
- If repair work with chemicals is performed inside the tanks, full face masks with appropriate filters must be used (ABE1).
- Ensure that no persons are working with an open flame in the vicinity of the tanks.

CYANIDE TANKS

- Due to the Hazardous classification of Cyanide, no work inside cyanide tanks to be done by BMM personnel.
- All work inside cyanide tanks will be outsourced to a certified/competent cyanide contractor.
- Cyanide specific controls will be used in conjunction with confined spaces and working at heights procedures. The risk assessment & procedures of the certified/competent contractor will be verified by responsible BMM personnel prior to any work commencing.

THICKENERS

- Ensure the thickener is drained and safe (a slurry bed will remain).
- Use leaning ladder to enter the thickener.

MILL RETURN TANK

- Ensure the tank is drained and safe.
- Use leaning ladder for access.

ENCLOSURES

- Entrants must use Personal Gas Monitoring Instruments whilst in enclosures, warning Attendant in the event of a high reading.

MAIN CONSUMER CABLE TUNNEL

- Access must remain controlled.
- Principle hazards are fire / smouldering, oxygen deficiency, carbon dioxide and carbon monoxide.

- Entrants must use Personal Gas Monitoring Instruments whilst in enclosures, warning Attendant in the event of a high reading.
- Remove cat ladder cages to improve access and rapid egress, especially for Emergency Response Team having to possibly fit SCBA sets through narrow ladder shaft.
- Due to long distance of the tunnel, Entrants must carry Full Face Masks with ABEK canisters with them during work in in tunnel.

ALL SLURRY & WATER TANKS

- Ensure the tank is drained and safe.
- Use leaning ladder to enter the tank.

BACKFILL FIRST STAGE MIXING TANK

- Remove the checker plate cover and agitator at the top of the tank.

BACKFILL SECOND STAGE MIXING TANK

- Drain and thoroughly wash the tank.
- Open manhole cover at the side of the tank.

CEMENT TRANSFER VESSEL AREA

- Ensure that the pressure vessel is empty.
- Release the air by opening the relieve valve and keep it open.
- Isolate and lock out the air supply to the vessel.

BACKFILL SLURRY TANKS

Working from the Bottom

- Drain the tank.
- Lock out and isolate the air supply.
- Wash and clean up any build-ups on top of the tank before entering.
- Remove either the manhole cover or the cone.

Working from the Top

- Work is conducted by rope access technicians.
- Drain the tank.
- Isolate and lock out the feed valves.
- Remove the bottom cone of the tank.

BACKFILL WATER TANKS

Working from the Bottom

- Drain the tank.
- Isolate and lock out the feed valves.
- Remove the bottom cone of the tank.

Working from the Top

- Work is conducted by rope access technicians.
- Drain the tank.
- Isolate and lock out the feed valves.
- Remove the bottom cone of the tank.

WORKING IN PITS DEEPER THAN 1.5M

- Ensure supply valves are closed, isolated and locked out
- Ensure the pit is drained

39 PERMIT TO ENTER CONFINED SPACE

- There must always be an effort made to eliminate the need to enter or work in a confined space, but if it is unavoidable, the following safe working guidelines must apply in conjunction with all Minimum Standard Entry Controls:
- Identify hazards and perform atmospheric test.
- Appoint Attendant and test communications.
- Install barriers and signs, warning of confined space work and protecting Entrants from external hazards.
- Ensure adequate lighting.
- Entrants must be equipped with appropriate PPE such as Dust Goggles, Dust Masks or Respirators with appropriate Filter, Industrial Climbing Helmets, Protective Clothing, etc.
- Ventilate confined space.
- Attendant to continuously test and monitor air quality.
- Entrants to carry Personal Gas Monitors.
- Hot work requires Hot Work Permit and follow Hot Work Procedures such as E-Ducting.
- Connect appropriate Access & Egress Equipment which must have inspection records available.

- Medical Certificates must be on file.
- Training Certificates must be on file.
- Rescue and Extrication Equipment must be available for immediate response.
- First Aid and Resuscitation Equipment must be available at the risk activity area.
- The Entrant must ensure that all equipment feeding into the confined space are isolated (sequence interlocking).
- Verify that conditions in the permit space are acceptable for entry throughout the duration of an authorized entry.
- Fill in Permit to Enter Confined Space, do Risk Assessment and apply with Permit Supervisor for a Permit.
- After issue, attached the Permit to Enter Confined Space to structure in risk activity area.
- Inspect tools and equipment before using it in the confined space;
- Enter confined space.
- Leave the confined space immediately if experiencing dizziness, light-headedness or difficulty to perform any functions.
- Attendant or Entrants must stop work immediately and order evacuation if conditions appear hazardous.
- Follow instructions and safety procedures.
- After testing for hazards, if any chemicals (paint, rubber lining trichlorethylene, fibre glass repairing, splicing) are applied inside a confined space a Full-Face Mask and appropriate Filter Canister must be worn by Entrants, and if the oxygen level is below 19.5%, Self-Contained Breathing Apparatus's must be used.
- Entrants must stay alert at all times and prepared to evacuate in the event of any irregularity or emergency.
- The Confined Space Entry Permit shall contain the following information (see Appendice 1):
- Reason for entry (work activity description and nature of work to be undertaken).
- Confined space to be entered (description, location, potential hazards, category: which Minimum Standard Entry Controls will be needed).
- Specific space work issues.
- Hazard identification and risk assessment.
- Name and signature of risk assessor.

- Isolation points (water / gas / steam / chemicals, mechanical / electrical drives, hydraulic / electric / gas / power, sludge / deposits / wastes, auto fire extinguishing systems, other, locks &/or tags fixed to solation points).
- Purging, ventilation & atmospheric monitoring controls (depressurisation, opening / venting, continuous purging or extraction, which elements / gases atmospheric testing required for, type of testing / monitoring required).
- Communication & stand-by controls (quantity of Attendants, rescue team, communication via voice / direct sight / radio / hand signals / other means).
- Rescue / extrication considerations (Attendant to handle, extrication equipment available at space, specific scaffolding or platforms erected, specific firefighting provisions, first aid kit and resuscitator in vicinity, other).
- Personal protective and access equipment (air purifying respirator, dust mask, fall protection / access & egress equipment, guideline, head protection, face shield / goggles / safety glasses, earmuffs / plugs, gloves, warning notices / barricades required, specific lighting provisions required, specific hot work controls required, other).
- Permit request name & signature.
- Black Mountain Mining official authorisation (Entry Supervisor).
- Implementation (atmospheric testing / monitoring guide (O_2 = >19.5%<23.5%, CO = <30ppm, H_2S = <10ppm, CO_2 = 5 000ppm, NH_3 = 25ppm, other, LEL = <5% < 10%).
- Atmospheric test results.
- Atmosphere in space safe to enter (with respiratory protection, air purifying device, SCBA.
- Entry authorisation from work coordinator in direct control & signature.
- Entrants + signatures.
- Withdrawal of entry by work coordinator in direct control authorisation + signature.

40 RESCUE PLAN

- Due to the nature of working in confined spaces, it is essential, as well as a legal requirement, to ensure that emergency procedures and the rescue plan are in place for immediate execution in the event of an emergency.

PRIOR TO ENTRY AND/OR WORK IN THE CONFINED SPACE (CONTINGENCY PREPARATION)

- The Entry Supervisor must ensure that equipment is sufficient and in good working condition.

- The Entry Supervisor must ensure that an adequate number of appropriately trained rescuers in the Emergency Response Team are available for immediate implementation of the rescue procedures and use of equipment.
- The Attendant must review and test communications line between Attendant, Control Room and Emergency Control Centre (dial 9999). This is particularly important when working outside normal working hours.
- The Attendant must review and test communications devices and procedures between Attendant and Entrants inside the confined space.

ON ENTRY AND WHILE WORKING IN THE CONFINED SPACE

- The Entrant must remain connected to either a Guide Line or Fall Arrest & Recovery Device.
- For hot work or in a fire hazardous area a Fire Watch with appropriate Fire Fighting Equipment is required.
- Attendant to stay in constant communication with all entrants in the confined space.
- The Attendant must be notified immediately if an Entrant recognises:
- Unusual action or behaviour.
- An unexpected hazard.
- An unsafe act.
- Detects a condition prohibited by the Permit to Enter Confined Space.
- Entrants must exit the confined space as quickly as possible when:
- An order to evacuate is given by the Attendant or Entry Supervisor.
- An Entrant recognises a sign or symptom of over-exposure.
- An unacceptable condition arises.
- An evacuation alarm is activated.
- Self-Rescue Equipment such as the Emergency Escape Breathing Apparatus, may be appropriate in situations where there will be limited time to escape or react to an anticipated emergency situation where air quality has decreased to hazardous levels.

IN THE EVENT OF A CONFINED SPACE RESCUE

- The Attendant does not enter the confined space but immediately informs the Emergency Control Room about the incident and Emergency Response Team via the control room of the incident.
- The plant control room operator must notify the relevant supervisor / shift leader and Permit Supervisor of the incident.

- The Attendant must remain in communications with the control room operator during rescue operations.
- The Attendant must assess the situation prior to assisting and administer first aid and/or resuscitation to any Entrants in distress, who has managed to escape from the confined space. First aid and/or resuscitation must continue until medical assistance or Emergency Response Team arrives at the scene of the incident.
- The area of the scene must be barricaded.
- The Attendant must test the quality of air and oxygen. Purge if necessary and monitor atmosphere.
- Dusty confined spaces cannot be purged without disturbing dust deposits and therefore Rescuers must use SCBA's.
- If any Poor Air Quality from Toxic Gas, Fume or Vapour is detected, Rescuers must enter the confined space with caution, using SCBA's and appropriate protective clothing (acid, flame or chemical resistant).
- The Rescuers must proceed to extract the Entrants using the Extraction Equipment and/or Stretchers if necessary.

EQUIPMENT FOR A HORIZONTAL CONFINED SPACE EXTRACTION

- Entrant in a horizontal confined space must be connected to a Guideline which ends outside the confined space. The Guideline can be used to locate the Entrant and can be used as a means to haul the Entrant away from the hazard(s) towards the exit.
- If the above fails, a Flange Clamp Access & Extraction System with Fall Arrest & Recovery Device should be used to fit over and inside the horizontal confined space flange. The Davit System or Clamp Anchor with Fall Arrest & Recovery can also be used in most circumstances to haul an injured or unconscious Entrant from through the opening of the confined space.
- A Rescuer must connect the Fall Arrest & Recovery Device's safe line to the casualty's harness link (or stretcher) and remain with the casualty, by providing fresh air (if necessary) and ensuring a smooth haulage towards and through the opening of the confined space.

EQUIPMENT FOR A VERTICAL CONFINED SPACE EXTRACTION

- The Tripod System must be used in vertical confined spaces such as manholes. The fitted Man-Riding Winch and / or Fall Arrest & Recovery Device which was used to lower or hoist the Entrant, are functional and appropriate extrication devices.
- The Davit System is also fitted with a Man-Riding Winch and / or Fall Arrest & Recovery Device, which is used for all confined space rescues, horizontal vertical or over an edge.

CONFINED SPACE RESCUE HARNESSES

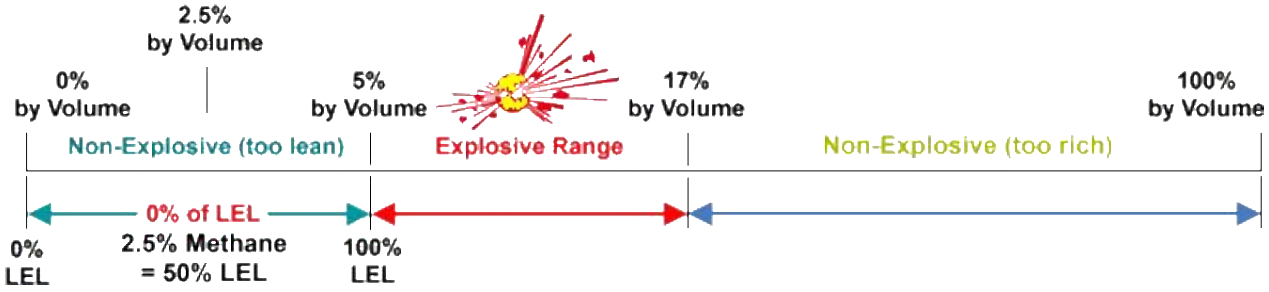
- The 2PR Harness is suitable to be rescued with, but a rescuer requires a more sophisticated harness with multiple connection points and the ability to sit in it for any certain time whilst accessing a confined space or attending to a vertical rescue, i.e. an Entrant who has slipped and collided with structures or being trapped.
- The 4PR Confined Space Suspension Harness is designed for prolonged suspension and rescue operations.
- The Upside-Down Confined Space Suspension Harness is designed to allow a Rescuer to reach a Casualty in a narrow space headfirst, from the access point.

RESUSCITATION AND FIRST AID EQUIPMENT

- Resuscitation and First Aid Equipment must be available for extricated casualties and administered by the Attendant, who must be trained accordingly.

41 GUIDE TO LOWER & UPPER EXPLOSIVE LIMITS FOR FLAMMABLE GASES & VAPOURS

- Before a fire or explosion can occur, three conditions must be met simultaneously. A fuel (i.e. combustible gas) and oxygen (air) must exist in certain proportions, along with an ignition source, such as a spark or flame. The ratio of fuel and oxygen that is required varies with each combustible gas or vapour.
- The minimum concentration of a particular combustible gas or vapour necessary to support its combustion in air is defined as the Lower Explosive Limit (LEL) for that gas. Below this level, the mixture is too ‘lean’ to burn. The maximum concentration of a gas or vapour that will burn in air is defined as the Upper Explosive Limit (UEL). Above this level, the mixture is too ‘rich’ to burn. The range between the LEL and UEL is known as the flammable range for that gas or vapour.
- Methane - LEL: 5% by volume in Air / UEL: 17% by volume in Air



LOWER AND UPPER EXPLOSIVE LIMITS

- The values shown in the table below are valid only for the conditions under which they were determined (usually room temperature and atmospheric pressure using a 2

inch tube with spark ignition). The flammability range of most materials expands as temperature, pressure and container diameter increase.

- All concentrations are indicated in % by volume.
- Visual example to show where on the scale % of LEL and UEL is measured

GAS	LEL	UEL
Acetone	2.6	13
Acetylene	2.5	100
Acrylonitrile	3	17
Allene	1.5	11.5
Ammonia	15	28
Benzene	1.3	7.9
1.3-Butadiene	2	12
Butane	1.8	8.4
n-Butanol	1.7	12
1-Butene	1.6	10
Cis-2-Butene	1.7	9.7
Trans-2-Butene	1.7	9.7
Butyl Acetate	1.4	8
Carbon Monoxide	12.5	74
Carbonyl Sulphide	12	29
Chlorotrifluoroethylene	8.4	38.7
Cumene	0.9	6.5
Cyanogen	6.6	32
Cyclohexane	1.3	7.8
Cyclopropane	2.4	10.4
Deuterium	4.9	75

GAS	LEL	UEL
Diborane	0.8	88
Chlorosilane	4.1	98.8
Diethyl benzene	0.8	...
1.1-Difluoro-1-Chloroethane	9	14.8
1.1-Difluoroethane	5.1	17.1
1.1-Difluoroethylene	5.5	21.3
Dimethylamine	2.8	14.4
Dimethyl Ether	3.4	27
2.2-Dimethylpropane	1.4	7.5
Ethane	3	12.4
Ethanol	3.3	19
Ethyl Acetate	2.2	11
Ethyl Benzene	1	6.7
Ethyl Chloride	3.8	15.4
Ethylene	2.7	36
Ethylene Oxide	3.6	100
Gasoline	1.2	7.1

GAS	LEL	UEL
Heptane	1.1	6.7
Hexane	1.2	7.4
Hydrogen	4	75
Hydrogen Cyanide	5.6	40
Hydrogen Sulphide	4	44
Isobutane	1.8	8.4
Isobutylene	1.8	9.6
Isopropanol	2.2	...
Methane	5	17
Methanol	6.7	36
Methylacetylene	1.7	11.7
Methyl Bromide	10	15
3-Methyl-1-Butene	1.5	9.1
Methyl Cello solve	2.5	20
Methyl Chloride	7	17.4
Methyl Ethyl Ketone	1.9	10
Methyl Mercaptan	3.9	21.8
Methyl Vinyl Ether	2.6	39

GAS	LEL	UEL
Monomethylamine	4.9	20.7
Nickel Carbonyl	2	...
Pentane	1.4	7.8
Picoline	1.4	...
Propane	2.1	9.5
Propylene	2.4	11
Propylene Oxide	2.8	37
Styrene	1.1	...
Tetrafluoroethylene	4	43
Tetrahydrofuran	2	...
Toluene	1.2	7.1
Trichloroethylene	12	40
Trimethylamine	2	12
Turpentine	0.7	...
Vinyl Acetate	2.6	...
Vinyl Bromide	9	14
Vinyl Chloride	4	22
Vinyl Fluoride	2.6	21.7
Xylene	1.1	6.6

42 GUIDE TO EQUIPMENT SPECIFICATIONS AND STANDARDS

- Equipment used in confined spaces must be of high quality and functional, conforming to relevant standards. The following specifications and standards apply to suggested controls:
- Industrial Climbing Helmet. Head protection is very important when working in an environment where bumps from low overhead structures or equipment may cause head injury. It is further a standard practice to wear safety helmets in confined spaces or when working at heights, with integral chin straps with a release mechanism (150N) when pulled on hard, to protect the wearer from neck injuries. In the event of a fall, the helmet must also stay on the wearer's head, to protect against collisions with structures and objects. For work in confined spaces, it is required to use a helmet with integral sweat band, textile suspension harness and reflective strips. Conformance: EN397 (industrial helmets).
- The **Rope Grab Fall Arrest-Restraint-Positioning System** is designed to be used as a temporary vertical or horizontal fall arrest and also as a restraint or positioning system, including on stable/secured ladders. It is further suitable to be used as a Guide Rope which can be used to locate a casualty in the event of a rescue, or for An Entrant to find his/her way by following the Guide Rope to the exit.
- The kit consists of a steel or alloy double action safety hook, Ø11mm Kernmantle Rope, a Rope Grab Fall Arrester, Connector, Anchor Sling and Bag. Conformance: EN353-2 (guided type fall arresters for flexible lines); EN1891 (low stretch kernmantle ropes); EN362 (connectors); EN358 (work positioning systems); EN795 Class B (temporary transportable anchors).
- **2PR Confined Space Harness** is a body holding device used to protect workers from falls by distributing the force of the fall over a large area of the body, ensuring that the subject of the fall remains suspended in an upright position after the fall has occurred. It is designed to minimize the risk of injuries caused by suspension.
- The harness should not be used for man-riding purposes due to the adverse effects of suspension trauma. 2PR features chest and dorsal fall arrest links and an overhead shoulder strap link. All fitting buckles are quick release snap-on's and fully adjustable. Conformance: EN361 (full body harnesses) and EN1497 (rescue harnesses).
- **4PR Confined Space Suspension Harness** is a fall arrest harness with special features used for man-riding, prolonged sitting/hanging suspended in a confined

space or at heights, work positioning and for rescue. The harness is designed for comfort and functionality.

- Three fall arrest links (chest, dorsal and overhead should strap links) are used for fall arrest and the chest or overhead links for man-riding. Hip bely links are used for work positioning. Conformance: EN361 (full body harnesses); EN1497 (rescue harnesses) and EN813 (sit harnesses).

Upside Down Confined Space Harness

- A rescue type harness used to allow safe access into a confined space head first, whilst being safely strapped to the Rescuer's ankles, around waist and shoulders. Conformance: EN1498 (rescue loops).
- The **Low Impact Force Inertia Reel Fall Arrest Block** is designed for connection to temporary anchors such as Tripods and Davits as a Retractable Fall Arrest Lanyard. The Attendant is also required to remain protected against falls when near unprotected edges or manholes and the Inertia Reel will offer freedom of movement to perform his/her functions whilst being protected.
- Maximum impact force is 3kN on anchor which will minimise forces and movement on the anchors.
- Conformance: EN360 (retractable type fall arresters).

Tripod System

- A temporary mobile anchor used for housing safety and winching devices for accessing manholes and similar vertical access confined spaces where there is a risk of a fall. The system comprises an aluminium Tripod, Man-Riding Winch (20-30m) [Fig. MW]; Retractable (Inertia Reel) Fall Arrest & Recovery Device [Fig. RB] and specific Pulleys and Fixing Brackets.
- The Fall Arrest & Recovery Device is used as a low distance fall protection device for vertical climbing in a confined space on a ladder or on structures, and features a recovery function which can be engaged after a fall. The recovery function is selected whilst the Casualty is suspended and operated as a man-riding winch for raising or lowering until the Casualty is able to regain his/her foothold.
- The Man-Riding Winch is used to lower or raise personnel into and from confined spaces, where no (or risky) means of access ladders or structures exist. It is required that the Fall Arrest & Recovery Device is used in conjunction with the Man-Riding Winch as a back-up for fall protection.
- Conformance: Tripod: EN795 Class B (temporary transportable anchors); Inertia Reel Fall Arrest & Recovery Device: EN360 & EN1496 (retractable fall arresters & rescue lifting devices); Man-Riding Winch: EN13157 (cranes, safety, hand powered lifting equipment).

Fall Arrest & Recovery Device

- An inertia reel designed to function as a retractable fall arrester, which will play out its safety line as the user moves away from the device and retract when coming closer. In addition, the device has a recovery winching facility, which is engaged manually to provide instant lowering and hoisting capabilities in order to bring a fall Casualty to a safe level for a foothold. Conformance: Inertia Reel Fall Arrest & Recovery Device: EN360 & EN1496 (retractable fall arresters & rescue lifting devices).
- The **Flange Clamp Access & Extrication System** is designed to be used as a temporary anchor with fall arrester c/w recovery function when working in confined spaces where entry is done by means of a horizontal manhole. The system consists of an assembly of Flange Clamp components and a Fall Arrest & Recovery Device.
- Conformance: Flange Clamp: EN795 Class B (temporary transportable anchors); Inertia Reel Fall Arrest & Recovery Device: EN360 & EN1496 (retractable fall arresters & rescue lifting devices).

Davit System

- The Davit Arm is used as a mobile anchor to house fall arrest and man-riding devices to lower or raise personnel into and from confined spaces from various positions. The system comprises an aluminum Davit Arm, Man-Riding Winch (20-30m) [Fig. MW]; Retractable (Inertia Reel) Fall Arrest & Recovery Device [Fig. RB] and specific Pulleys and Fixing Brackets.
- The Fall Arrest & Recovery Device is used as a low distance fall protection device for vertical climbing in a confined space on a ladder or on structures, and features a recovery function which can be engaged after a fall. The recovery function is selected whilst the Casualty is suspended and operated as a man-riding winch for raising or lowering until the Casualty is in a position to regain his/her foothold.
- The Man-Riding Winch is used to lower or raise personnel into and from confined spaces, where no (or risky) means of access ladders or structures exist. It is required that the Fall Arrest & Recovery Device is used in conjunction with the Man-Riding Winch as a back-up for fall protection.
- The Davit System is designed to be fitted with a variety of Base Anchors, which may be selected according to the position outside the confined space. Conformance: Davit Arm: EN795 Class B (temporary transportable anchors); Inertia Reel Fall Arrest & Recovery Device: EN360 & EN1496 (retractable fall arresters & rescue lifting devices); Man-Riding Winch: EN13157 (cranes, safety, hand powered lifting equipment).
- Floor Mount Davit Base; Wall Mount Davit Base; Sunken Floor Mounted Davit Base - Conformance: EN795 Class A (structural anchors for vertical, horizontal or inclined surfaces).
- Free Standing Quad Leg Davit Base; Structure Clamp Davit Base; Counterweight Davit Base. Conformance: EN795 Class B (temporary transportable anchors).

Blower / Extractor Fan with Ducting

- The blower requires both a positive air blowing function and air extraction / sucking function. Ducting must be ordered in lengths corresponding to the depth of confined spaces. Capacity: +-440L/sec. Power rating: 0.75kW. Voltage: 240V.

Remote Controlled Multi-Gas Detection Instrument with Telescopic Probe and Sensors

- A mobile Multi-Gas Detector which is supplied with a telescopic probe and sensors to reliably measure combustible gases and vapours as well as O_2 and harmful concentrations of O_3, Cl_2, CO, CO H2-CP, CO_2, H_2, H_2S, HCN, NH_3, NO, NO_2, PH_2, SO_2, $COCl_2$, organic vapours, Odorant and Amine. An optional External Pump, which operates with an Extension Hose up to 30m long, makes it possible to use the detector for pre-entry measurements into confined spaces such as tanks, shafts, etc. The Pump starts automatically when the detector is inserted.
- Conformance: EN50270 (electromagnetic compatibility. electrical apparatus for the detection and measurement of combustible gases, toxic gases or oxygen).

Personal Gas Monitors

- A small, mobile Gas Detector carried with the Entrant on person to detect & monitor O_2 levels, CO_2, CO, H_2S, etc. Conformance: EN50270 (electromagnetic compatibility. electrical apparatus for the detection and measurement of combustible gases, toxic gases or oxygen).

Zone Gas Monitors

- The Zone Gas Monitor is designed to connect a series of gas monitors in larger areas and transmit information between Entrants / confined spaces and Attendants. A visual and audible alarm will indicate the zone where hazards are detected.
- The **Personal Escape Breathing Apparatus** allows safe and uncomplicated escape from hazardous environments. The apparatus is fitted with a Hood, Positive-Pressure Breathing Device in a soft bright colored bag with shoulder sling. Air supply is 10-15 minutes. The hood seals all face especially with facial hair.
- Conformance: EN1146 (respiratory protective devices for self-rescue. self-contained open-circuit compressed air breathing apparatus incorporating a hood - compressed air escape apparatus with hood).
- The **Personal Distress Alert Device** is a fully electronic signal and warning unit for use with compressed air breathing apparatus and closed-circuit breathing apparatus.

43 APPENDICES

- Permit To enter Confined Space

- Working on Heights Permit to Work

44 RESPONSIBILITY

- Heads of Department must ensure that all mandatory content is listed on the Index.
- Everyone with access to the EDRMS must follow the standards and rules listed in this document.
- Line managers must ensure that employees in their charge are trained and comply with the requirements of all controlled documents, which includes, inter alia, Codes of Practice, Standards, Procedures, Rules, Policies, and Guidelines, and that such training is recorded.
- Procedures – The designated Approver is responsible for the technical accuracy of procedural documents, which includes SWP's.
- Departmental Document Library Controller – person responsible for document control for a specific department.
- Custodian – Responsible for the timeous revision of documents and ensuring that relevant rules and standards are followed throughout the lifecycle of the document.
- Approver – responsible for reviewing the documents for adequacy prior to use.

45 DISTRIBUTION AND ACCESS

- The latest revision of this document is available as a read only on the document on the Intranet. The Compliance Officer shall maintain an authorised hard copy of this policy/procedure in the relevant location.
- Line Managers, who have staff reporting to them that do not have access to the Intranet, shall ensure that these personnel are adequately guided and informed.