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National Authority

INDUSTRY GUIDANCE NOTE

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Guidelines to Confined Space

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1. Purpose

Certain procedures are necessary for preparation, entry and restoration of a confined space by any personnel. Examples of confined spaces may include but are not limited to storage tanks and vessels, underground storage areas, buildings and shacks.

Excavations, including well cellars, which meet the definition of a confined space and are to be entered by personnel may constitute permit-required confined spaces if they have the potential for hazardous atmospheres or serious safety hazards which cannot be eliminated.

The purpose of this document is to describe the safe working methods that are required when working in a confined space.

2. Applicable Laws

Workplace Safety and Health Order, 2009

Workplace Safety and Health (General Provisions) Regulations, 2014

Workplace Safety and Health (Construction) Regulations, 2014

3. Scope

A confined space means any infrequently accessed area, any enclosed space, above or below ground, where a hazard to health may exist due to lack of oxygen, the presence of a suffocating, toxic or flammable atmosphere, or an actual or potentially hostile environment such as:

- (a) storage tanks;
- (b) silos;
- (c) reaction vessels;
- (d) enclosed drains;
- (e) sewers;
- (f) pipelines;
- (g) cargo, ballasts and voids on board ships;
- (h) deep excavations.

Others may be less obvious, but can be equally dangerous, for example:

- (a) open-topped chambers;
- (b) vats;
- (c) combustion chambers in furnaces etc;
- (d) ductwork;
- (e) unventilated or poorly ventilated rooms.

4. Responsibilities

4.1. Authorised Manager/ Competent Person

- Responsible to issue the Permit to Work (PTW) if required.

4.2. Confined Space Safety Assessor

- Responsible to inspect the work periodically.
- Provide guidance to supervisors and contractors.
- Ensure a risk assessment has been carried out for the work.
- Cascades health and safety information to the workers using a toolbox talk.
- Ensures an emergency plan is in place.
- Ensures that the atmosphere in the confined space has been tested prior to entry.
- Ensures that the atmosphere in the confined space is tested at frequent intervals and remains gas free for the duration of any tank entry.
- Ensure there is suitable access and egress from the confined space.

4.3 Confined Space Attendant

Confined space attendants shall be responsible for ensuring that:

- The safety of personnel inside the enclosed space is closely and constantly monitored.
- The record of all personnel, tools and materials entering and leaving the confined space is maintained.
- Emergency and rescue services and equipment are available.
- All personnel entering the confined space are aware of the relevant safety procedures.
- Raises the alarm when there is any doubt as to the safety of the persons within the confined space.

- Communication is established and is always maintained with personnel entering and whilst within the space.

4.4 Gas Tester

Gas Testers are responsible for ensuring that:

- the equipment they use is:
 - (i) suitable for the atmosphere to be tested;
 - (ii) of an approved type;
 - (iii) properly calibrated and maintained;
 - (iv) within its validation period;
- they are sufficiently knowledgeable to interpret the results correctly;
- they are aware of the likely contaminants and the appropriate testing regime;
- they will report any concerns or changes in gas free condition to the appropriate supervisor immediately;
- gas testing is done immediately prior to the issue of any document relating to the confined space entry.

4.5 Worker

- To follow all instructions carefully and stops the work if he feels it is unsafe.
- Not enter the confined space unless he is confident that it has been adequately tested and is gas free.
- Raise the alarm if there is any concern with the confined space and immediate exit the space if he feels the conditions warrant it e.g. loss of communication with the attendant.
- Use all necessary and available equipment to ensure his safety and the safety of others working within the confined space.
- To enter a confined space only if authorised to do so.

5 Procedure

5.1 Permit to Work (PTW)

It is a legal requirement under regulation 10(g) of the *Workplace Safety and Health (Construction) Regulations, 2014* that work involving entry into a confined space is carried out using a Permit to Work(PTW).

Such PTW shall be issued by a supervisor of the person who is to enter or work in the confined space. A supervisor is the one who has the correct knowledge, training and experience to authorise the work.

The supervisor must be satisfied that all necessary precautions have been taken and provisions made to secure the safety of those entering the confined space, before signing the PTW.

Confined space entry permit

A confined space that contains a hazardous atmosphere which cannot be controlled or a serious physical hazard which cannot be eliminated. A confined space attendant must be present, and the confined space attendant, Entry Supervisor and Entrant must complete and all must sign the confined space entry permit form. However, a confined space entry permit may be reclassified as a non-permit Confined Space whenever the hazardous atmosphere or serious physical hazard can be reliably removed. Such a condition would only be permitted and approved by the Supervisor of the site.

Note: Whenever a confined space entry permit is reclassified as a result of an atmospheric hazard, continuous monitoring must be performed.

A Permit shall be reissued every –

- (a) 12 hours, end of shift, end of job, whichever occurs first, or
- (b) When a new hazard is introduced.

When any emergency condition exists, any existing permit shall be cancelled.

5.2 Risk Assessment

Before work commences in a confined space, the following risks shall be systematically assessed for their potential to affect persons involved in the work activities:

- (a) Oxygen deficiency;
- (b) Oxygen enrichment;
- (c) Chemical/toxic substances;
- (d) Flammability, fire and explosion;
- (e) Any adjacent work that might be in conflict with the confined space entry;
- (f) Introduction of any equipment that may undermine the atmospheric condition within the space;
- (g) Physical hazards, including those which may affect the means of escape.

5.2.1 Oxygen deficiency – suffocation

The ordinary air that we breathe every day contains around 21% oxygen. A fall to 17% brings on the start of ill effects including the loss of co-ordination and concentration, together with abnormal fatigue. A fall to 10% brings on breathing difficulties, unconsciousness and death can follow quite quickly.

Oxygen deprivation may be the result of:

- (a) The displacement of oxygen by gas leaking in from elsewhere, or the deliberate introduction of purge gas;
- (b) Oxidization, rusting or bacterial growth using up the oxygen in air;
- (c) Oxygen being consumed by people working and breathing, or by any process of combustion;
- (d) Welding;
- (e) The prior discharge of a fire extinguishing system containing halon or carbon dioxide.

It is a legal requirement under regulation 25 of the *Workplace Health and Safety (General Provisions) Regulations, 2014*, that no person is allowed to work in a confined space where the oxygen in air is below 19.5% unless:

- (a) Suitable breathing apparatus is being continuously worn and used;
or
- (b) The space has been adequately ventilated and a competent person or certified gas tester has tested and certified the air to be adequate and safe for entry without breathing apparatus.

Where work has to be done inside any chamber, tank, vat, pit, pipe, flue or confined space, in which -

- (a) dangerous fumes are liable to be present to such an extent as to involve risk of fire or explosion, or persons being overcome by the fumes; or
- (b) the supply of air is inadequate, or is likely to be reduced to be inadequate, for sustaining life.

It shall be the duty of the occupier of a factory to ensure that there is adequate and convenient means of access and egress from the confined space and a means to frequently and appropriately monitor the quality of air within the space.

Any person entering or remaining in the confined space, shall have the following in place –

- (a) wearing of a suitable breathing apparatus;
- (b) adequately trained and briefed of the hazards, emergency signals and actions to be taken within the space;
- (c) has been authorised to enter by the responsible person; and
- (d) where reasonably practicable, is wearing a safety harness with a rope securely attached and there is a person keeping watch outside who is provided with the means to pull him out in an emergency.

A responsible person shall not certify a confined space under *Workplace Safety and Health (Construction) Regulations, 2014* (see regulation 25(4)) unless -

- (a) effective steps have been taken to prevent any ingress of dangerous fumes;
- (b) any sludge or other deposit liable to give off dangerous fumes has been removed and the space contains no other material liable to give off dangerous fumes; and
- (c) the space has been adequately ventilated and tested for dangerous fumes and has a constant supply of air adequate to sustain life, and he has taken account for the purposes of paragraph (b) of any deposit or other material liable to give off dangerous fumes in insignificant quantities only and put in place measures for the safety of any persons entering, working within or requiring to exit the confined space.

It shall be the duty of the responsible person of a person entering or working in a confined space to ensure that a sufficient supply of suitable breathing apparatus, of safety belts and ropes, life lines and of suitable reviving apparatus and oxygen are -

- (a) provided and kept readily available;
- (b) properly maintained; and
- (c) thoroughly examined by a competent person at least once a month and records maintained.

No person shall enter or remain in, and no person shall require, permit or direct any other person to enter or remain in, any confined space in which the proportion of oxygen in the air is liable to have been reduced to below 19.5% by volume unless -

- (a) he is wearing a suitable breathing apparatus and is fully familiar with its use; or
- (b) the space has been and remains adequately ventilated and a competent person has tested and certified it as -
 - (i) containing an adequate supply of oxygen; and

(ii) safe for entry without breathing apparatus.

5.2.2 Oxygen Enrichment

Atmospheres containing more than 21% of oxygen by volume shall be considered to be oxygen enriched. Entry into oxygen enriched atmospheres is prohibited at all times and under all circumstances.

An oxygen enriched atmosphere is, in itself, a major hazard. Organic materials such as oil and grease become highly combustible and ordinary materials like paper and clothing will burn with exceptional ferocity.

An increase of only 4% oxygen is sufficient to create a hazard and this may occur inadvertently. In oxy-acetylene and oxy propane processes, sometimes not all of the oxygen supplied to a cutting torch is consumed. Some may be released, increasing the atmospheric oxygen above the normal 21%. The oxygen enrichment of atmospheres in confined spaces also results from the practice of using oxygen to sweeten or enrich the atmosphere when it has become oppressive, stale, hot, fume filled or otherwise unpleasant. **This is a very dangerous practice and must be prohibited.**

Another way in which the atmosphere may become oxygen-enriched is through leakage from torches or hoses during meal breaks or overnight. For this reason, they should always be removed at each break-time. The deliberate kinking or nipping of an oxygen hose while changing a torch does not usually cut off the supply completely and can result in the release of substantial quantities of oxygen.

If excess oxygen is discovered, the space should be ventilated until normal levels of oxygen are regained. No entry shall be permitted until it is deemed safe to do so by the competent person.

5.2.3 Chemical / Toxic Substances

However much oxygen is present in the atmosphere, if there is also a toxic gas present in sufficient quantity, it will create a hazard. Some of the many toxic gases which may be encountered include:

- (a) Hydrogen sulphide, usually from sewage or decaying vegetation
- (b) Carbon monoxide from internal combustion engines, or any incomplete combustion, especially of Liquefied petroleum gases (LPG)
- (c) Carbon dioxide from any fermentation or being naturally evolved in soil and rocks, or coming from the combustion of liquefied petroleum gases
- (d) Fumes and vapours from chemicals such as ammonia, chlorine, sodium and from petrol solvents.

Petrol and diesel engines create carbon monoxide, which is an extremely toxic gas hazard; and liquid petroleum gas engines create an excess of carbon dioxide, which is a suffocating hazard. The use of any form of internal combustion engine within a confined space is prohibited, unless a specifically dedicated exhaust extraction system is operative and it is deemed safe by a competent person.

5.2.4 Flammability / Fire and Explosion

Some gases need only be present in very small quantities to create a hazard. A few of major sources of explosive and flammable hazards are:

- (a) Petrol or liquefied petroleum gas, such as vapour, propane, butane, and acetylene. These are explosive in the range of 2% in air upwards. The hazard is normally created by a spillage or leakage;
- (b) Methane and hydrogen sulphide, which are naturally evolved from sewage or decaying organic matter. These are explosive in the range of 4% in air upwards;
- (c) Solvents, acetone, toluene, white spirit, alcohol, benzene, thinners, etc. These are explosive in the range of 2% in air upwards.

In an explosive or flammable atmosphere, a toxic or suffocating hazard may also exist. Where there is any doubt, entry shall not be permitted until a certified gas tester has tested the atmosphere within the confined space using a multi gas detector or draeger tubes, as relevant.

5.2.5 Physical Hazards

Apart from the hazards dealt with above, other dangers may arise from the use of electrical and mechanical equipment, from chemicals, process gas and liquids, dust, paint fumes, welding and cutting fumes.

Extremes of excess heat and cold can have adverse effects and may be intensified in a confined space. Further dangers exist in the sheer difficulty of getting into or out of and working in a confined space. The potential hazard of an inrush of water, gas sludge, etc. due to failure of walls or barriers, or leakage from valves, flanges or blanks, must all be considered at the risk assessment stage.

5.3 Information, Instruction and Training

The training needs of each of the categories of employees considered for confined space working should be considered:

- (a) Supervisors
- (b) Employees entering confined spaces
- (c) Gas tester
- (d) Persons employed as confined space attendants outside confined spaces
- (e) Rescue personnel.

Some of the roles identified may be carried out by the same person.

5.4 Confined space attendants

Access to confined spaces shall be controlled by a confined space attendant who has been trained and instructed in his responsibilities. Note that in the case of entry into a confined space which is not certified gas free, two confined space attendants are required and must be available at the entrance at all times during the entry.

Where there are multiple access points in use, there shall be a confined space attendant at each access.

Confined space attendants shall be provided with:

- (a) radio or other special means of continuous communication with the persons within the confined space;
- (b) emergency and rescue equipment and personnel readily available;
- (c) emergency medical aid readily available;

When air line breathing equipment is being used by the persons carrying out the work in a confined space, the confined space attendants shall ensure that:

- (a) air quality has been tested and found acceptable prior to the start of work and at weekly intervals thereafter;
- (b) air receiver pressure is adequate and being maintained;
- (c) the integrity and availability of back-up supplies is acceptable;
- (d) communication are tested and any physical signals between those entering and the attendants are known and rehearsed;
- (e) air lines are laid such that they cannot be damaged nor impede the movements of the equipment users.

Confined space attendants shall be supplied with and be trained and competent in the use of self-contained breathing apparatus (SCBA) and a lifeline, together with any other equipment necessary to effect the rescue of personnel from inside the confined space.

When SCBA equipment is in use by the persons carrying out the work in a confined space, confined space attendants shall ensure that -

- (a) regular checks are maintained on the status of the SCBA sets;
- (b) low pressure audible alarms are tested before each entry;
- (c) communication are tested and any signals between those entering and the attendants are known and rehearsed;
- (d) exposure times are calculated and monitored.

Confined space attendants shall NOT carry out other tasks whilst they are carrying out their duties as confined space attendants and shall not leave the access point unattended while persons are inside the confined space.

When work is suspended, confined space attendants shall ensure that all personnel have vacated the confined space and shall erect barriers and signs to prevent unauthorised access to it. Not permit re-entry unless it is proven and safe to do so.

5.5 Safe Working

Safe working in a confined space can only be achieved by the use of a Permit to Work (PTW) system in which each step is planned and all foreseeable hazards are taken into account. Such a system, backed up by adequate rescue facilities, should enable work to be carried out safely.

At the planning stage it will be necessary to determine -

- (a) Whether an entry into the confined space is required, or whether an alternative method of doing the work exist (see Sample of Checklist 1);
- (b) Whether an entry is necessary, whether it can be carried out without the use of breathing apparatus (see Sample of Checklist 2);
- (c) Whether the entry must be made with the use of breathing apparatus (see Sample of Checklist 3).

Once it has been decided that personnel must enter a confined space, a toolbox talk or safety briefing should be held, with all personnel involved and effective lines of authority and communications established and tested, in order to minimize any risk of subsequent misunderstanding.

5.6 Isolation

The confined space must be isolated from all possible external sources of danger to persons entering it. A full PTW system should be used to record the location and types of isolation and the hazards being guarded against.

Electrical isolation must never rely on a switch or fuse. The switch gear or fuse holder must be locked off and the key lodged with a Permit to Work, issued by an authorised person.

Mechanical isolation of pipe work should not rely on a single valve or on a non-return valve; these may lead to and create a hazard. Whenever possible, a section of pipe should be removed or blank or spade should be put into a flange between the valve and the confined space.

Paddles, stirrers or agitators, whether electrically or mechanically operated, should be physically disconnected by the removal of an operating arm.

5.7 Cleaning

There are a variety of methods of cleaning the inside of confined spaces to remove hazardous solids, liquids or gas. Cold water washing, hot water washing and steaming will remove many contaminants, while solvents or neutralizing agents may be necessary for others. If hot water or steam is used, with or without a solvent, care must be taken to ensure that adequate ventilation exists for steam pressure and that condensation does not build up to unacceptable levels.

If steam is used or water is boiled in a confined space, account must be taken of the vacuum that can be created on cooling.

When steam or solvents are used, these may in themselves create a toxic, suffocating or flammable hazard; even though a space has been well cleaned, it must not be entered until the atmosphere within the space has been adequately tested and there are suitable arrangements for it to be monitored.

Great care must be taken when dealing with any sludge or heavy deposits which may release hazardous fumes when disturbed.

5.8 Purging and Ventilation

Air purging and ventilation may be carried out by removing covers, opening inspection doors, etc. and allowing ordinary air circulation or by the introduction of compressed air via air line. Higher rates of air exchange can be achieved by the use of air movers, induction fans or extractor fans.

It is especially important that when an inert gas (e.g. nitrogen) has been used to purge or render inert a flammable atmosphere, the inert gas itself is properly purged with air.

When air purging is taking place, the flow of air should be of a sufficient volume and velocity to ensure that no pockets or layers of gas remain undisturbed.

5.9 Atmospheric Monitoring

Before an entry is made into a confined space, tests must be carried out to establish the levels of oxygen, toxic gas or flammable gas in the atmosphere. If entry into the confined space is necessary to carry out the tests, breathing apparatus or other respiratory protective equipment must be worn.

The tests applied should take account of what the space is known to have contained, including any inert gas used to purge a flammable atmosphere which may itself produce toxic hazards or the risk of asphyxiation. Account must also be taken of hazards arising from other sources such as materials used for cleaning. Methane, hydrogen sulphide and carbon dioxide can all evolve naturally due to the decomposition of organic matter or, in some cases, by the effect of rain water percolating through certain types of ground. It is necessary to test the atmosphere of a confined space at both high and low level as well as in any corners, etc. where pockets of gas may exist. Instances have occurred of carbon dioxide displacing oxygen below ground level, while a normal oxygen level continues to exist above.

The sense of smell must never be relied upon to detect gases. Some gases are odourless and hydrogen sulphide, in particular, can paralyse the sense of smell to such an extent that even fatally high concentrations of the gas cannot be

detected. In any case, the sense of smell varies from person to person and deteriorates with age.

A wide range of portable gas detection equipment is available for flammable and toxic gases; some are specific to one gas (e.g. hydrogen sulphide), while others can sample a range of different gases. Such instruments need to be properly calibrated.

5.10 Continuous Monitoring

The initial monitoring and testing must establish that the confined space is safe to enter. Monitoring should then be carried out at intervals to ensure the continued safety of personnel. Tests should be repeated after any breaks, such as lunch or overnight, or after the time limit set out in a PTW has expired.

5.11 Communications

Adequate, effective and regular communications must exist between those inside and those outside the confined space, so that, in the event of an incident, a warning can be given and the space evacuated or those inside rescued. The system needs to be 'fail safe', ensuring that if a reply is not received or a scheduled call not made, the procedure for rescue starts immediately. Where there is a breakdown of communications, any work within the confined space entry should be immediately stopped and persons which exit the space and entry should not be permitted until it is safe to do so.

5.12 Use of Tools / Electrical Appliances

If there is any possibility of flammable gas existing in a confined space, even below the lower explosive limits (LEL), all tools must be of a non-sparking material and all lighting and electrical equipment must be appropriate for use in confined spaces. Smoking and naked lights must be strictly prohibited and care must be taken to avoid the generation of static electricity with the consequent risk of sparks.

Regulation 42 of the *Workplace Safety & Health (Construction) Regulations, 2014* requires electric hand-held tools and inspection lamps and lights are operated at a voltage not exceeding 55 volts between conductor and earth.

5.13 Rescue

If a person is INJURED in a confined space which has been certified safe to enter without respiratory protection, an entry can be made to rescue and remove them immediately.

When a person COLLAPSES in a confined space and the cause is not the known, *irrespective* of whether or not the confined space was certified fit for entry without respiratory protection, no person shall enter unless he is wearing a breathing apparatus and he is familiar with the rescue plan. The collapse may have been due to deterioration in the atmosphere within the confined space or the in-rush of a toxic or suffocating gas from outside. The first duty of any rescuer is to ensure that he does not become a casualty himself.

5.14 Rescue Equipment

Every person entering a confined space wearing a breathing apparatus must also wear a safety harness. The harness must be attached to a lifeline, attended by a person outside the confined space. This equipment forms part of a safe system of work for any entry into a confined space. Properly used, it may enable a rescue to be carried out successfully without the need for a rescuer to enter the confined space.

Rescue equipment must include some means of lifting or pulling a person up from a confined space, since it is virtually impossible for the average person to achieve this solely by muscular effort. There are a variety of tripods, winches, blocks and tackles which, when used in conjunction with a safety harness, enable a person to be lifted quickly and safely out of a confined space.

5.15 Respiratory Protective Equipment

A wide range of types of respiratory protective equipment is available from various manufacturers. The equipment functions on the basis of two distinct principles outlined below -

- (a) By purifying the air breathed. The air inhaled is drawn through a filter or medium that removes the harmful substance or pollutant. The nature of the filtering agent depends on the type of pollutant to be dealt with. These types are commonly called *respirators*.

The simplest form of respirator is the 'Nuisance dust mask', a preformed cup made of filtering material which fits over the nose and mouth to filter out nuisance dust. These masks give no protection against harmful or toxic materials.

More complex types have filter cartridges that may be general for various types of dust or fumes or specific to a particular substance.

- (b) By supplying clean air. The air can be supplied straight through an airline via a pump or compressor or, alternatively, the person may carry compressed air in cylinders. These types are known as *breathing apparatus*.

Preparation

In a preparation for entry, a Confined Space Entry Permit shall be initiated and completed according to the following procedure:

1. Each space must be inspected and evaluated by a qualified individual (Entrant, Attendant, or Entry Supervisor) prior to entry and periodically thereafter to ensure that conditions remain consistent with the permit. Evaluation will include atmospheric condition tests and a serious physical hazard assessment.
2. Signs and/or barricades shall be posted outside confined spaces to notify unauthorised personnel that entry is in progress. Personnel entering the area shall read and adhere to all precautions, signs and permits. If they are not assigned to assist with the entry, they are not to enter the area. If the confined space is left unattended, access to the space is to be secured.

3. The confined space must be properly isolated utilising blinding, line disconnection, and lockout/tag out.
4. Communication equipment and arrangements should be tested and available prior to any entry being permitted.
5. Atmospheric tests for oxygen, explosive and toxic gases and vapors shall be performed and recorded on the confined space entry permit form immediately prior to entry.
6. After work breaks or interruptions in the work procedure or at periodic intervals, the continuing safety of workers in the **space is to be ensured**. At a minimum, the following atmospheric hazards shall be tested and be within these acceptable levels:
 - Oxygen = 19.5% - 23.5%
 - Lower Explosive Limit = <5%

Note: If other atmospheric hazards exist, then appropriate air monitoring must be conducted. Example: Hydrogen Sulfide, Carbon Monoxide.

7. If the test indicates a hazardous atmosphere, efforts to control the condition are to be made utilizing ventilation controls. Forced air ventilation or an explosion-proof electric fan is required, if explosion gases or vapors are present. If other conditions exist, the space must be purged, steam washed, etc. to sufficiently free of all possible contaminants.
8. Where flammable or combustible gases or liquids are present, all sources of ignition shall be eliminated or controlled. Fire extinguisher(s) and other fire fighting equipment shall be available.
9. Safety hazards are to be eliminated or controlled.

10. Forced air ventilation and other equipment must be properly grounded or bonded to prevent static sparks. Lighting equipment must be explosion proof and have a ground fault circuit interrupter (GFCI).
11. If the confined space's atmospheric tests are beyond the acceptable limits, the space is classified as a permit required confined space and must have a confined space attendant and an Entry Supervisor trained to perform these duties. The confined space attendant is to be stationed outside the confined space to remain indirect communication with the worker(s) inside. The Entry Supervisor may serve as the confined space attendant provided they are trained to do so.
12. Rescue equipment including lifelines, harnesses, air supply systems and hoists must be in use when entering all permit required confined spaces. A trained rescue team is to be available when personnel are required to a Confined Space.
13. First aid and CPR training is required for rescue personnel and recommended for confined space attendant/Entry Supervisors. First aid supplies are readily available on site.

Entry

1. Entry may be made by authorised personnel after preparation requirements have been met and a Confined Space Entry Permit form has been signed, issued and posted at the entry of the confined space. Authorised personnel designated to enter the space should review the provisions of the permit and sign the Permit.
2. The confined space atmosphere should be tested regularly during entry to ensure a safe work environment. Consideration should be given to continuous monitoring when permit conditions change. Records of all such tests to be maintained.

Restoration

When work is complete and the confined space is ready to be returned to service, the Permit should be used as a checklist for proper restoration of the space.

Additional points to consider include:

- Are all personnel out of the space?
- Are all blinds removed, vents closed, etc. per the list compiled during preparation?
- Are all equipment and tools removed?
- Are all entryways and flanges closed and sealed?
- Have start-up procedures been reviewed?

Sample of Checklist 1 - Work in Confined Space Without Entry of Persons

| | Item | Check |
|----|---|-------|
| 1. | Ensure that entry into the confined space is totally prohibited | |
| 2. | Ensure that the isolation of services and processes is carried out as necessary | |
| 3. | Wash, clean and purge the workplace, as appropriate, for work to be done | |
| 4. | Ensure that there is a safe system of work for persons concerned | |
| 5. | Ensure that other persons know that work is going on | |
| 6. | Authorise work to commence only on the issue of a Permit to Work (PTW) | |

Sample of Checklist 2 – Entry Into Confined Space Without Breathing Apparatus

| | Item | Check |
|-----|---|-------|
| 1. | Commence a Permit to Work (PTW) procedure | |
| 2. | Withdraw the confined space from service | |
| 3. | Isolate the workplace from electrical, mechanical, chemical, heat and all other sources | |
| 4. | Check that no inward leakage of gas, steam or liquids | |
| 5. | Clean, drain and purge the workplace as necessary for the types of work to be carried out and entry to be made | |
| 6. | Test atmosphere for oxygen, flammable gas, toxic gas | |
| 7. | Carefully check any sludge or deposit that may harbour gas | |
| 8. | If necessary, clean, purge and ventilate the workplace again until the atmosphere is safe to enter | |
| 9. | Ensure that all tools and equipment are safe to use in the area | |
| 10. | Check the provision of protective clothing, harness, lifelines, rescue equipment, rescue personnel | |
| 11. | Ensure that rescue personnel are trained in the use of equipment and capable of using it | |
| 12. | Brief all personnel on what is to be done, arrange and test communications | |
| 13. | Issue the Permit to Work (PTW) and authorise entry. Fix a time scale within which the work should be completed | |
| 14. | Constantly monitor the workspace and communications | |
| 15. | If the task is completed within the time scale, advise all concerned, to cancel the Permit and return the confined space to service | |
| 16. | If the work is not completed in time, withdraw all personnel and start commence the Permit to Work (PTW) procedure again | |

Sample of Checklist 3 – Entry Into Confined Space With Breathing Apparatus

| | Item | Check |
|----|--|-------|
| 1 | Commence the Permit to Work(PTW) procedure | |
| 2 | Withdraw the confined space from service | |
| 3 | Isolate the workplace from electrical, mechanical, chemical, heat, etc. sources | |
| 4 | Check there is no inward leakage of gas, steam, liquids, etc. possible | |
| 5 | Clean, drain and purge the workplace as necessary for the type of work and entry | |
| 6 | Test the atmosphere for flammable gas, toxic gas, oxygen, etc. | |
| 7 | Decide on which type of breathing apparatus is to be used | |
| 8 | Ensure that the personnel involved have a current valid certificate for the type and use of breathing apparatus | |
| 9 | Ensure that all tools and equipment are safe for use in the work area | |
| 10 | Check the provision of protective clothing, harness, lifelines, rescue personnel, etc. | |
| 11 | Ensure that rescue personnel are adequately trained in the use of rescue equipment and are capable of using it correctly | |
| 12 | Brief personnel on what is to done, arrange and test communications | |
| 13 | Issue the Permit to Work (PTW) and authorised entry into the workplace. Fix timescale within which the work should be completed | |
| 14 | Constantly monitor the workspace and communications | |
| 15 | If the task is completed within the time scale, advise all concerned, to cancel the Permit and return the confined space to service | |
| 16 | If the work is not completed in time , withdraw all personnel and start commence the Permit to Work (PTW) procedure again | |

It must be stressed that all personal protective equipment (PPE) in general and respiratory protective equipment in particular must have been specified by a competent person, who is clearly aware of all of the circumstances surrounding its use.

END