

1. INTRODUCTION

- 1.1.1 Where it is not reasonably practicable to avoid entering a confined space to undertake work, the employer or self-employed person is responsible for ensuring that a safe system of work is used.
- 1.1.2 This Guidance Note outlines the hazards associated with Confined Space Entry and details the precautions and considerations necessary to ensure a safe system of work.

1.2 What the law says

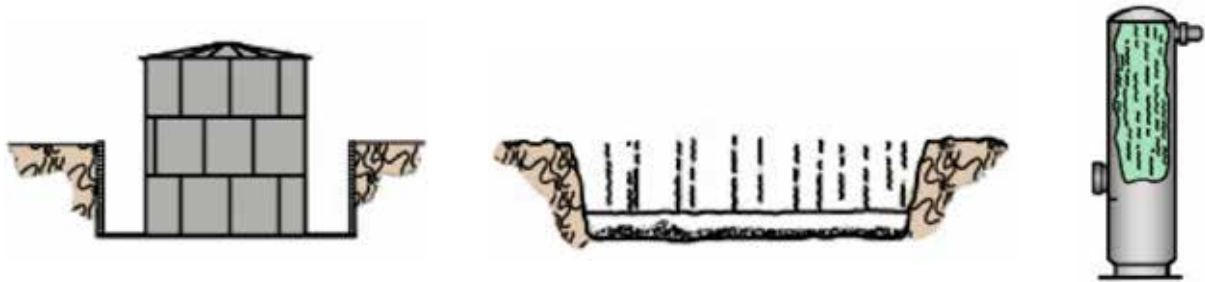
- 1.2.1 You must carry out a suitable and sufficient assessment of the risks for all work activities for the purpose of deciding what measures are necessary for health and safety in accordance with The Management of Health and Safety at Work Regulations 1999, (regulation 3) and the Confined Spaces Regulations 1997.
- 1.2.2 For work in confined spaces this means identifying the hazards present, assessing the risks and determining what precautions to take. The risk can only be decided by considering the beneficial effect of a control measure (i.e. a precaution). Therefore the order should be:
1. identify hazards;
 2. consider the effect of each control measure or set of control measures;
 3. decide whether the residual Risk Level is acceptable.
- 1.2.3 If needed the benefits of various control measures can be considered in turn to find the most appropriate. In addition a control measure often introduces a new hazard that needs to be assessed.



2. SCOPE AND APPLICABILITY

- 2.1.1 For the purpose of this document a Confined Space Entry covers entry into a variety of workplaces which have limited access and or inadequate ventilation in which gases, vapours or physical hazards can present a risk to personnel. Including free flowing granular materials can engulf a person- eg sand, salt, grain; or steep sided stockpiled materials can collapse. Also water and other liquids can present a risk to personnel.
- 2.1.2 Typical examples of Confined Spaces encountered, although not restricted to:
- Tanks
 - Ducts
 - Vessels
 - Silos
 - Roof Voids

- Work around open storage tanks
- Work within bund walls
- Any work underground e.g. excavations, sewers, drains culverts, tunnels and other such similar places.
- Sheeting of scaffold in areas of poor ventilation.



Examples of Confined Spaces

Critical consideration – a poorly maintained or oxygen starved gas, oil or solid fuel domestic boiler with a flue feeding combustion products into a fully sheeted temporary roof scaffold will cause a rapid and dangerous rise in the level of carbon monoxide. Before this becomes lethal it can cause disorientation that increases the risk of a fall.

2.1.3 The hazards created by Confined Spaces due to the build up of harmful gases or vapours can cause suffocation, poisoning or explosion. The most likely hazards are as follows:

- Flammable substances and oxygen enrichment
- Toxic gas, fume or vapour
- Oxygen deficiency
- The ingress or presence of liquids
- Solid materials which can flow
- Presence of excessive heat
- Restricted movement

Critical consideration – some vapours may be visible and some gases may have a characteristic smell but some toxic or oxygen replacing gases have no smell, no colour, no taste, don't cause a headache or other symptom and entry into a pocket of gas can cause immediate loss of consciousness and rapid death.

2.1.4 Where a main contractor has a permit to work system in place, they are generally responsible for the control of Confined Space Entry. In this case robust permit to work procedures will be followed at all times. In places where no permit to work system is used, operatives and supervision should take proper care and consult with the main contractor as to the control measures to be implemented. A comprehensive risk assessment should be carried out and a safe system of work put in place to ensure a safe working environment. Additionally it may be foreseeable that the company could create a Confined Space Environment during sheeting operations in areas of poor ventilation in which hazardous products and/or vapours are present.

2.1.5 Toxic gases or vapours can be present in a Confined Space for a variety of reasons and the following are typical examples although, not restricted to:

- Product contained in tank/vessel of which residue/slurry still remains.
- Products used to clean/treat areas from which residue/slurry still remains.
- Ancillary operations by other tradesmen such as painting, welding or thermal insulation that gives rise to toxic gases or vapours.

- Plant emitting diesel or petrol fumes e.g. generators, pumps, compressors and vehicles.
- Plant emitting CO₂ such as heaters or other similar equipment.

Critical consideration – Fuel leaks and refuelling spills are common causes but exhaust gases that are not ducted to open air are the worst. Generators must not be run inside buildings or other confined areas and petrol cut-off saws etc should not be used in poorly ventilated areas.

2.1.6 The primary risk associated with work in Confined Spaces is that of oxygen deficiency normally caused by:

- Displacement of oxygen by other gases/vapour.
- Oxidation, rusting, fire or growth of bacteria (using existing oxygen up).
- The presence of flammable or explosive gas or substances.
- The presence of toxic gas or substances.

2.1.7 The normal oxygen content of breathable air is 21%. A small reduction in oxygen percentage can lead to impaired mental ability. The effects are very rapid and generally there will be no warning to alert the senses. Very low oxygen concentrations (i.e. below 16%) can lead to unconsciousness and death. Any difference in oxygen content from normal should be investigated, the risk assessed, and appropriate measures taken in the light of the risk.

Critical consideration – investigate, determine cause, remove hazard or select control measures, ensure risk acceptable before entry.

2.1.8 Other hazards that can contribute to hazards already present within a Confined Space are as follows:

- Heat – Resulting in thermal stress etc.
- Noise – Which can become intensified within Confined Spaces.

Contact with the product – This may call for the use of uncomfortable protective equipment that by design may contribute to the risk involved in erecting and dismantling scaffolding.

Critical consideration – wearing protective equipment in turn may increase body temperature. Eye and hearing protection can make communication more difficult. In areas where dust or toxic vapour are present do not underestimate the difficulty of breathing through a filtered face mask which takes a lot of effort whilst doing heavy work. (Note that respiratory protective equipment that relies on a filtered face mask or similar is of no use in an oxygen deficient area. In such areas either air must be ducted in from outside, or breathing apparatus must be used.)

Mechanical Equipment – This could present a risk of ignition or physical injury.

- Lighting – May be inadequate within Confined Spaces.
- Electrical equipment might be a potential source of heat.

Critical consideration – electrical plant within the confined space can be a potential ignition source and may need to be isolated. Electrical equipment taken into an area that may contain flammable gas, vapour or liquid should be intrinsically safe vapour proof and may need to be Atex rated equipment.

3. PROCEDURE

3.1 Responsibilities

- 3.1.1 It is the responsibility of the Employer, Client or Main Contractor in control of the Confined Space to ensure that all relevant information is conveyed to all relevant persons before any entry to the workplace is allowed. It is recommended that any person responsible for pricing work in Confined Spaces consider any extra cost of equipment, labour and resources so as to ensure that any Confined Space Entry undertaken is properly planned.
- 3.1.2 It is the responsibility of the Employer, Client or Main Contractor in control of the Confined Space to ensure that any unauthorised access to the area is physically obstructed and that adequate warning notices are in place.
- 3.1.3 It is the responsibility of the Employer, Client or Main Contractor in Control of the Confined Space to outline precautions required to enter the Confined Space and to operate an effective Permit to Work system. In addition it shall also be the responsibility of the Employer, Client or Main Contractor to under-take any periodic or continuous monitoring of the environment with regard to oxygen / flammable and toxic gas or substance levels in which the operatives are requested to work.

Critical consideration – *Portable or fixed gas detectors are the main way of monitoring the level of flammable, toxic or asphyxiant gases or vapours. These are set to alarm well before the critical level is reached and clear evacuation procedures should be in place. Gas detection equipment needs a high level of maintenance to ensure it works correctly. The system should be demonstrated before entry and if the alarm sounds evacuation should be immediate. Where it would take more than a few seconds to leave the confined space each person may need to carry a self rescue kit that provides breathing air. Full training is needed in how to use such equipment.*

- 3.1.4 The responsibility and control of the Confined Space is that of the Employer, Client or Main Contractor is to control of the Confined Space providing any specialised Safety and/or Rescue Equipment associated with Confined Space Entry requirements and ensure suitable and adequate means of communication.
- 3.1.5 The Scaffold Contractor shall be responsible for items 3.1.1 to 3.1.2, only by prior written agreement and under such circumstances must ensure items 3.1.1 to 3.1.2 are complied with and that they are satisfied that all reasonably foreseeable steps are taken by the Client or Main Contractor in control of the Confined Space to provide information and resource so as to ensure a safe system of work.

3.2 Application of Confined Space Entry assessment and control

- 3.2.1 The following sections apply only to work that the Scaffold Contractor has contractually agreed to undertake, with responsibility for the assessment and control of any Confined Space Entry.
- 3.2.2 Assessment to consider:
- An individuals fitness to enter into a confined space through a medical referral, consideration should be given to the following factors: claustrophobia or fitness to wear breathing apparatus.
 - Appointment of a confined spaces supervisor.
- 3.2.3 Supervisors should be given responsibility to ensure that the necessary precautions are taken, to check safety at each stage and may need to remain present while work is undertaken.
- Suitable, physical barrier in place at all points of access.
 - Any sources of danger such as valves, are isolated so as to ensure that no toxins enter the area.
 - Establishing oxygen levels in the area.
 - Flammability levels in the area.

- Personal Protective Equipment required for safe entry (e.g. respirators, protective clothing, eye protection, hand protection, rescue equipment etc.).

3.2.4 Work in Confined Spaces must only be undertaken by employees who are competent and have been properly trained for the job and evidence of that training must be made available. Training should be updated periodically by a recognised training provider as appropriate. The precise form of the training and instruction must depend on the individual operations, but in addition to any specialised training, training for work in Confined Space could include:

- Observance of the safe system of work (Permit to Work).
- Instruction on the use and maintenance of breathing apparatus.
- Instruction in the use of atmosphere testing equipment.
- Appropriate training in procedures for rescue.
- Instruction in first aid, treatment of shock & resuscitation.
- Instruction in procedures for emergencies and evacuation.
- Instruction and practice in the use of fire fighting equipment.
- Environmental factors of entry (e.g. noise, humidity, lighting etc.).
- Activity to be undertaken in Confined Space.
- Length of time personnel to be in Confined Space.

3.3 Control Guidelines

- Permit-to-Work System
- Consider safety line that can be used to pull or lift an unconscious person a short distance to fresh air.
- Always raise the alarm before attempting rescue. Multiple fatalities are common where one person after another goes in to attempt rescue.
- Air quality tests (Periodic/Continuous).
- Flammability tests
- Stand by Man in Attendance (to summon assistance if needed).
- Emergency plan (Rescue harnesses, spare Breathing Apparatus).
- Forced ventilation and/or extraction.
- Personal Protective Equipment.
- Fire precautions (Fire Extinguisher etc.).
- Appropriate means of communications i.e. Radio.
- Emergency lighting.
- COSHH controls and occupational exposure monitoring.

3.3.1 If necessary the Scaffold Contractor should consult and/or appoint specialist

FURTHER GUIDANCE

Safe work in confined spaces. Confined Spaces Regulations 1997. Approved Code of Practice, Regulations and guidance L101 – 3rd Edition December 2014 ISBN 978 0 7176 6622 5

Directive 99/92/EC (also known as 'ATEX 137' or the 'ATEX Workplace Directive') on minimum requirements for improving the health and safety protection of workers potentially at risk from explosive atmospheres

In Great Britain the requirements of Directive 99/92/EC were put into effect through regulations 7 and 11 of the Dangerous Substances and Explosive Atmospheres Regulations 2002 (DSEAR).

HSE web site INDG258

Working with substances hazardous to health: What you need to know about COSHH. INDG136

All HSE publications can be downloaded free from www.hse.gov.uk

Whilst every effort has been made to provide reliable and accurate information, we would welcome any corrections to information provided by the Writer which may not be entirely accurate, therefore and for this reason, the NASC or indeed the Writer, cannot accept responsibility for any misinformation posted.



NASC

NASC, 4TH FLOOR, 12 BRIDEWELL PLACE, LONDON EC4V 6AP
TEL: 020 7822 7400 FAX: 020 7822 7401
enquiries@nasc.org.uk www.nasc.org.uk