

## Relevant Legislation

*Confined Spaces Regulations 1997*

## Definition of a Confined Space

A confined space is any enclosed space, above or below ground, where a hazard to health may exist due to oxygen enrichment or deficiency, the presence of a suffocating, toxic or flammable atmosphere or an actual or potentially hostile environment.

Examples of confined spaces are culverts, vats, tanks, cellars, pits, tunnels, excavations, sewers, silos, shafts or chambers. A confined space is not necessarily small. Some areas may become confined spaces when work is carried out, during their construction, fabrication or subsequent modification.

## General

Work in confined spaces can be a high risk activity which requires very careful consideration of the safety implications. Although undertaking risk assessment has been a legal requirement for many years, the Confined Spaces Regulations focus on the risk of serious injury from work in confined spaces and require specific controls to be applied.

The regulations contain the following key duties:

- as a priority, a risk assessment must be carried out to identify the measures needed so that work in a confined space can be avoided.
- if, in the light of the risks identified, it is not reasonably practicable to carry out the work from outside the confined space, a competent person must assess the risks associated with entering and working in the confined space so that safe systems of work can be implemented. The assessment will also identify anyone else who may be affected by the work, for example other workers, contractors and the general public.

The system of work will include consideration of:

- the task and the level of risk associated with it.
- the working environment.
- working materials and tools.
- the suitability and competence of those carrying out the task.
- the arrangements for emergency rescue, which must be put into place before work starts.

## Duty to Avoid Entering Confined Spaces

When completing a risk assessment in respect of a confined space consideration should be given to careful planning or a different approach which may eliminate or reduce the need for working in a confined space.

If the intended work is essential it may be possible to modify the confined space itself so that entry is not necessary or so that work can be completed from outside, for example:

- blockages in silos may be cleared by the use of remotely operated rotating flail devices, vibrators or air purgers.
- inspection, sampling and cleaning operations can often be carried out from outside the space using appropriate equipment and tools.
- remote cameras can be used for internal inspection of vessels.

## What if it is not Reasonably Practicable to Avoid Entry?

If it is not reasonably practicable to carry out work from outside of the confined space, a further risk assessment must be completed by a competent person. This assessment will take into account all foreseeable risks and identify all precautions which are to be included in the safe system of work. Once assessments have been completed, a record of the assessment must be kept on file in a designated location.

## Safe Systems of Work

When it is not reasonably practicable to avoid entry or it is necessary to enter the confined space in order to carry out an emergency rescue, a safe system of work must be developed and put into practice. This must take full account of the precautions identified and may include a permit to work in more hazardous operations.

The results of the risk assessment will help to identify the necessary precautions to reduce the risk of injury. These will depend on the nature of the confined space itself and the inherent risk posed by the activity. The work should be allocated a high, medium or low risk categorisation. All safe systems of work for high risk activities should be discussed with the Corporate Health and Safety Team prior to work commencing. A checklist is included later in this section to assist staff to determine the risks. This checklist is not intended to be exhaustive but includes many of the essential elements to help establish a safe system of work.

## Training

Employees responsible for undertaking confined spaces risk assessment, or those involved in developing safe systems of work, should have completed 'Confined Spaces Awareness' training and general 'Risk Assessment' training. Staff undertaking high risk activities should also complete a more advanced course. Such courses are available from Draeger or a suitable equivalent training provider.

Emergency rescuers must be competent and their training tailored according to the nature of the risks associated with working in confined spaces. For low risk activities an emergency first aid course combined with a confined spaces awareness course may be sufficient. For high risk activities the aforementioned training may need to extend to a team of employees who have undergone intensive training for rescue. This would include training on the use of any equipment provided for rescue, such as breathing apparatus, harnesses, lifelines, tripods, fire fighting equipment, together with enhanced certificated first aid training. Rescuers also need to be protected against the cause of the emergency.

## Arrangements within the Each Directorate

### Safe entry and work within Confined Spaces

In accordance with current legislation and Northumberland County Council's Corporate Health and Safety Policy Statement Directorates must devise and implement procedures to ensure the following objectives are achieved:

- Avoid working within confined spaces where it is reasonably practicable to do so.
- Plan and undertake the confined space work safely using only competent, adequately trained personnel for the management, supervision and execution of the work.

In order to achieve the above objectives the relevant Director is responsible for ensuring suitable and sufficient arrangements are made to fulfil the requirements detailed below:

#### 1. Identify Competent Staff

Assign only competent Managers, Supervisors and Operatives to work in confined spaces.

#### 2. Provide suitable well maintained equipment

This will include equipment to be used in the event of an emergency and/or to make a rescue.

#### 3. Employ a Safe System of Work

Devise and implement a written safe system of work which adheres to the requirements of the checklist appended to this section.

This checklist has been devised to help managers develop safe systems of work for confined spaces.

**WORKING IN CONFINED SPACES MUST BE PREVENTED UNTIL SUCH TIME AS THE PERSON RESPONSIBLE FOR CONTROLLING THE WORK IS SATISFIED THAT ALL ELEMENTS OF THIS CHECKLIST HAVE BEEN CONSIDERED AND, WHERE APPLICABLE, COMPLIED WITH IN FULL**

## Appointment of a Supervisor

The degree of supervision necessary will be based on the findings of the risk assessment. Supervisors should be given responsibility to ensure that suitable precautions are taken, to check safety at each stage and, when necessary, remain present whilst work is undertaken.

## Competency and Suitability for the Task

Supervisors and staff must be competent to carry out work in confined spaces. Employees must have sufficient experience in the type of work to be carried out, and have received the relevant training. Where risk assessment highlights exceptional constraints as a result of the physical layout, supervisors must ensure that individuals are of suitable build. The competent person may need to consider other factors, such as the possibility of staff experiencing claustrophobia or their fitness to wear breathing apparatus. Medical advice on an individual's suitability may also be needed.

## Permits to Work

A permit to work ensures a formal check is undertaken to guarantee all the elements of a safe system of work are in place before people are allowed to enter or work in a confined space. It is also a means of communication between site management, supervisors, and those carrying out the hazardous work. Permits are generally required in high risk situations.

Essential features of a permit to work system are:

- clear identification of who may authorise particular jobs (and any limits to their authority).
- clear identification of who is responsible for specifying the necessary precautions (such as isolation, air testing and emergency arrangements).
- ensuring that contractors engaged in carrying out the work are included in the permit (together with their signature of compliance).
- the provision of training and instruction in the issuance and use of permits.
- monitoring and auditing to ensure that the system works as intended.

## Communications

An adequate system is needed to enable communication to be maintained between people inside and outside the confined space and in order to summon help in an emergency. Out of hours work, such as night time work, shift work and weekends should not be forgotten. Moreover, times when the premises are closed, such as holidays, must also be taken into account.

Before entry, it may be necessary to test the atmosphere in the confined space to determine whether it is safe to enter and carry out work. Testing will determine whether the atmosphere is oxygen deficient or oxygen enriched and whether toxic and flammable vapours are present. Testing should be carried out by a competent person using a suitable gas detector which is correctly calibrated. Where risk assessment indicates that conditions may change, continuous monitoring of the air may be necessary.

## Testing the Atmosphere in the Confined Space

### Cleaning or Purging

This may be necessary to remove any harmful residues present within the confined space. There are many different types of cleaning and purging available. A competent supervisor will determine the type needed via risk assessment. Where purging has been carried out, the atmosphere will need to be tested to check that purging has been effective, and that it is safe to breathe before allowing people to enter.

### The Size of the Entrance

The entrance must be large enough to allow safe access and egress for workers wearing all the necessary equipment, including equipment to be used in the event of an emergency. For example, the size of the opening may mean choosing air-line breathing apparatus in place of self-contained breathing apparatus. The former is less bulky and therefore more likely to make quick escape easier in the event of an emergency.

### Provision of Adequate Ventilation

Ventilation of the confined space may be improved by using natural or mechanical means. Natural ventilation can be achieved by opening several doors, openings or manholes to increase air movement. Where this is not practicable, or air movement is insufficient, mechanical ventilation may be required, such as air movers.

*Warning:* carbon monoxide contained within the exhaust of internal combustion engines is extremely hazardous. The use of such equipment in confined spaces must be prohibited.

## Isolation

Mechanical and electrical isolation of equipment is essential if it could otherwise operate, or be operated, inadvertently. If gas, fume, vapour or free flowing solids could enter the confined space, then physical isolation or “locking off” of mechanical/electrical equipment is needed. In all cases checks should be made to ensure isolation is effective. This is normally done by use of a permit to work system.

## Provision of Special Tools and Lighting

Non-sparking hand tools and intrinsically safe power tools and lighting are essential where flammable or potentially explosive atmospheres are likely. In certain confined spaces (for instance, inside metal tanks) suitable precautions to prevent electric shock include the use of low voltage equipment, such as 110v power tools and 25v hand lamps.

## Provision of Respiratory Protective Equipment (RPE)

### The Working Set

This is essential if the air inside the space cannot be made respirable due to the presence of a gas, fume or vapour, or the lack of oxygen. The type of RPE used for working in a confined space must also be suitable for emergency rescue purposes. The RPE would be situated outside of the confined space and worn by members of the rescue team in the event of an emergency. ‘Sweetening’ the air in a confined space with oxygen must never be attempted as an alternative to wearing breathing apparatus. Such action can greatly increase the risk of a fire or explosion.

### The Escape Set (for self rescue)

This must only be used for an emergency escape when the gas detector alarm is activated. The mask must be donned and escape made via the arranged exit. Normal air supply time is between 10 and 15 minutes duration. On no account must the escape set be used to attempt a rescue or be used as a working set.

## Maintenance of Equipment

All the equipment provided or used for working in confined spaces must be kept in good repair and efficient working order. This is likely to include periodic examination and testing, as necessary. Before being used some items of equipment require an inspection. Records of examination and tests should normally be kept for at least five years.

## Personal Protective Equipment (PPE)

All PPE required for use in the confined space will be highlighted via risk assessment. This may include respiratory protective equipment, waterproofs, gloves and harnesses. Arrangements for storage of PPE must also be included in the assessment.

## Emergency Procedures

If things go wrong, people may be exposed to serious and immediate danger. Effective arrangements for raising the alarm and carrying out rescue operations in an emergency are essential.

Contingency plans will depend on the nature of the confined space, the risks identified and, consequently, the likely nature of an emergency rescue. Emergency arrangements will depend on the risks. Preparation of emergency arrangements will need to cover the necessary equipment, training in the use of equipment and practice drills. It may be necessary to shut down any adjacent plant before attempting emergency rescue.

## Summoning Assistance

Subject to risk assessment, it may be necessary to station someone outside the confined space to keep watch and to communicate with anyone inside, raise the alarm quickly in an emergency and take charge of the rescue procedures.

## Rescue and Resuscitation Equipment

Lifelines attached to harnesses should run back to a point outside the confined space.

Provision of suitable rescue and resuscitation equipment will depend on the likely emergencies identified in the risk assessment. Where such equipment is provided for use by rescuers, training in correct operation is essential.

## First-Aid Procedures

Trained first aiders need to be available to make proper use of any necessary first-aid equipment provided. In the case of low risk activities this may be an appointed person trained in emergency resuscitation techniques. For high risk activities employees must be trained to an appropriate certificated standard which may include paramedic training.

## Local Emergency Services

On medium to high risk activities, local emergency services (for example the Fire & Rescue Service and Ambulance Service) should be made aware of the work activity. Information about the particular dangers in the confined space should be made available to them upon arrival at an emergency.



The Health and Safety Team is available to provide further guidance and advice on any proposed procedures.

Prior to publication/implementation all proposed procedures must be discussed with the lead contact Health and Safety Officer via the appropriate Directorate/Divisional Safety Group. This step is necessary to verify that there is no variance with the legislation on which the policy is based.