

Science and Technology Facilities Council

WORK IN CONFINED SPACES

STFC Safety Code No 11

Rev.2.0, Issued November 2024

Revisions

1	Initial Launch	November 2007
1.1	Minor changes	May 2011
1.2	Amendments to training and audit sections	May 2013
1.3	Document Retention Policy Added	August 2014
1.4	Minor addition to definition of ‘confined space’	April 2015
1.5	Minor changes to reflect the launch of SHE Assur	October 2018
1.6	Added HSE flow chart as Appendix	April 2019
1.7	Minor change to para 4.1.4 to cross-reference SC24	December 2022
2.0	Major Re-write	November 2024

Contents

1 Purpose 4
2 Scope 4
3 Definitions 5
4 Responsibilities 5
4.1 Directors 7
4.2 Line Managers and Supervisors 7
4.3 Confined space permit to work issuers 7
4.4 Employees, users, contractors and tenants 8
4.5 SHE Group 9
4.6 Entry Controller 9
4.7 Entrants 10
4.8 Bottom Person 11
Appendices
1 Detailed Specific Guidance .....
2 Confined Space Procedural Flow Chart .....
3 Confined Space Risk Assessment Procedure .....
4 Sample Risk Assessment .....
5 Confined Space Entry Checklist .....
6 Confined Space Entry Card .....
7 Confined Space Permit to Work .....
8 Sample Safe System of Work .....
9 Training Requirements .....
10 Audit Checklist .....
11 Confined Space Register Template .....
12. Document Retention Policy .....

CONFINED SPACES CODE

1 Purpose

The purpose of this policy is to prevent fatalities or injuries resulting from any work regarding confined spaces by:

- Establishing the requirements necessary to protect all personnel from the potential hazards that may be encountered while performing tasks in confined spaces.
- Undertaking a systematic inspection of the workplace to identify all potential confined spaces and implementing control measures to eliminate potential hazards.
- Defining the requirements for those people involved in performing confined space work.
- Establishing guidelines to enable individual teams to eliminate the potential injuries of any magnitude associated with working and entering confined spaces.
- This procedure covers all work carried out in identified confined spaces.
- Due to the size of our STFC space, there could be others “lost business intelligence” we may not be aware of until a realistic confined space register has been confirmed.

Confined spaces can pose a significant risk to employees and other personnel. Approximately 62% of confined space fatalities are due to atmospheric conditions. It is imperative to implement an effective process for managing the risks associated with confined spaces and hazardous atmospheres to significantly reduce or eliminate the risk of harm to personnel.

The fatalities are not just confined to complex plant, work in simple storage vessels is just as hazardous. Those killed also include people who try to rescue trapped personnel without proper training and equipment.

This policy outlines the steps to be taken by STFC to ensure that staff or others do not work in confined spaces where it can be avoided. Where this is not possible a written suitable and sufficient risk assessment must be undertaken and a safe system of work developed.

2 Scope

This policy is applicable to all staff, temporary staff, users, contractor employees and tenants that are required to work in confined spaces (authorised entrants), serve as entry controllers during a confined space entry, or supervise others who enter or attend during entries within STFC.

This document provides a system for:

- controlling work in a confined space
- minimising the risks associated with working in a confined space

- minimise the impact of causing injuries
- the appointment of competent persons to manage, oversee and perform any such work
- the documentation for use in the application of this Procedure.

This document does not apply to restricted spaces and the management of. They will be considered under a separate risk assessment which will be produced by the individual departments for the identified task.

Work in a confined space is governed by UK legislation, the Confined Space Regulations 1997. In summary, these regulations:

- prohibit entry into a confined space to carry out work unless there is no other reasonably practicable method to carry out the work
- require any such work in a confined space to be carried out in accordance with a safe system of work
- require that a safe system of work should be in writing and set out the work to be done and the precautions to be taken
- require adequate arrangements to be made for the rescue of any person in the event of an emergency.

Authoritative guidance on methods by which compliance with the Confined Spaces Regulations may be achieved is given in the form of an Approved Code of Practice and Guidance published by the Health and Safety Executive (HSE ACOP L101) - Safe working in confined spaces. These Safety Rules and Procedures are to be read in conjunction with the above ACOP. Additional guidance can be found in Occasional Guidance Note – the Classification & Management of confined Space Entries published by Water UK.

Note: The regulations do not apply to “any place below ground in a mine”. However, this code should be adhered to within any STFC facility housed in any mine or underground, for example CERN or Boulby Mine.

3 Definitions

In March 2023 the HSE revised its definition of a confined space to be - A confined space is one which is both enclosed or largely enclosed and has a reasonably foreseeable specified risk to workers.

Specified Risk:

a. Serious injury to any person at work arising from a fire or an explosion.

b. The loss of consciousness of any person at work arising from an increase in body temperature. Loss of consciousness or asphyxiation of any person at work arising from gas, fume, vapour, or the lack of oxygen.

c. The drowning of any person at work arising from an increase in the level of liquid.

d. The asphyxiation of any person at work arising from free-flowing solids.

It may be small and restrictive for the worker, or it could be far larger such as a grain storage silo with hundreds of cubic metre capacity.

Some places may become a confined space when work is carried out or materials introduced, or during their construction, fabrication or subsequent modification (e.g carrying out hot work in an unventilated room will increase the temperature, and hence increase body temperature, which may make it a confined space.

Confined spaces are not defined by the physical dimensions of a space but by the hazards that may arise in the space. Well established examples of confined spaces include sewers; chemical storage/reaction tanks; silos; fuel tanks; pressure vessels. Examples of confined spaces in the STFC could include large experimental vessels; hot roof voids; underground tunnels etc. See Appendix 2 for a '**confined space**' decision tree.

Restricted Space

The HSE do not give a clear definition on what a restricted space is or can be.

STFC definition: a restricted space is an area where access and or egress is difficult or there is restricted working space which presents a hazard or other risks or reasons that requires controlled access.

Typical examples within STFC can include:

- Plant rooms depending on entry, space and exit complexities.
- Electrical distribution substations and cupboards.
- Roof spaces over fragile ceilings or narrow walkways.
- Basement areas.
- Tunnels where there is little room to manoeuvre

4 Responsibilities

4.1 Directors shall:

4.1.1 Ensure that only competent persons are authorised as “confined space permit to work issuers”; see Appendix 9 for training requirements. The appointment should be recorded in SHE Directory where the geographic/equipment scope of the appointment should be defined

4.2 Line Managers and Supervisors shall:

4.2.1 Ensure that every effort is made to avoid entry into a confined space. Where entry into any confined space cannot be avoided, a suitable and sufficient assessment of the risks to health must be carried out in accordance with STFC SHE Code No 6 ‘Risk Management’, see Appendix 1. See Appendix 3 and 4 for guidance on carrying out such assessments and for a completed example.

4.2.2 Ensure that, prior to entry into a confined space, a written safe system of work, including emergency procedures, risk assessment and method statement, has been developed (see Appendix 8 for an example safe system of work) and a confined space permit to work issued by an authorised confined space permit to work issuer, see Appendix 7. See SHE Directory.

4.2.3 Ensure that all staff involved in entry into confined spaces are aware of this code, understand its content and comply with local procedures and safe systems of work.

4.2.4 Ensure all staff who will enter a confined space are fit to do so. See SHE Code 24, Health Surveillance and Health Screening Medicals.

4.2.5 Ensure that all staff who enter confined spaces and those who issue permits to work have appropriate information, instruction, training and supervision in confined spaces working (see Appendix 9).

4.2.6 Ensure that the guidance Confined Space Entry Assessment checklist (see Appendix 5) is completed for all levels of confined space entries and is retained within the relevant departments for a period of 3 years. This checklist must be made available upon request.

4.3 Confined space permit to work issuers:

4.3.1 Permit Issuers are responsible for the overall confined space entry and must coordinate all entry procedures, tests, any other permits, equipment and other relevant activities. Only issue confined space permits where they are competent to do so having successfully completed training defined in Appendix 9. They shall not issue permits for work they are going to carry out themselves unless this has been countersigned by another confined space permit to work issuer.

4.3.2 Assess all associated risks involved in the entry into a confined space, which will also include a safe system of work (risk assessment, method statement and issue a confined space permit, ensuring all necessary precautions, including emergency procedures, are taken, see Appendices 3, 4, 7 & 8. (STFC acknowledge that some of this maybe undertaken by a suitably qualified contractor and he risk assessment and method statement will be presented by the contractor to the permit issuer for approval before the permit is issued).

4.3.3 Oversee the issue of any permit and its closure or cancellation and check safety at each stage of the work.

4.3.4 Discuss with the entry controller and entrants the safe system of work, and the risk rescue plan and ensure that this is understood.

4.3.5 Ensure that any monitoring, fall arrest and recovery equipment has been correctly identified and in place.

4.3.6 Ensure that all monitoring, access and rescue equipment is adequately maintained, calibrated and inspected. Date of inspection must be recorded using the Confined Space Entry Checklist (See Appendix 5) and the Confined Space - Entry Card (Appendix 6).

4.3.7 Will ensure that the Permit to Work and any other associated permits are displayed at the point of entry or if this is not possible, associated documentation is available.

4.3.8 Verifies, by checking that the appropriate entries have been made on the Permit and Confined Space Entry Checklist, all tests specified by these have been conducted and that all procedures and equipment specified by them are in place before issuing the Confined Space Permit and allowing entry to begin.

4.3.9 Terminate the entry and close the permit when entry is complete.

4.3.10 Verify that rescue arrangements are available and that the means for summoning them are operable.

4.3.11 Validate the entrant/s are trained to the correct level of specified risk for the confined space (Low, Medium, High) and have up to date Health Surveillance and cleared to act as Entry Controller. In the event that contractors are performing the Confined Space entry it is up to the permit Issuer to verify that they are trained and gain evidence. This evidence will be kept with the permit for the specified time.

4.3.12 Remove unauthorised persons who enter or attempt to enter the space during entry operations.

4.4 Employees, users, contractors and tenants shall:

4.4.1 Provide and assist with the assessment of risks and comply with any safe system of work developed through risk assessment and comply with any requirements of a confined space permit to work.

4.4.2 Inform line management of any known health issues that may preclude them from working in a confined space.

4.4.3 Inform their managers if they suspect that the system of work in place, or planned, could be ineffective or inadequate. Report all incidents, including near misses, procedural failures or equipment defects, in accordance with **SHE Code 5 "Incident Reporting and Investigation**" using the STFC incident reporting system (*Evotix Assure*).

4.5 SHE Group shall:

4.5.1 Maintain and make available to staff a list of authorised persons competent to issue confined space permits. This can be viewed for clarification purposes via the SHE Directory which can be found on the SHE SharePoint site.

4.6 Entry Controller:

4.6.1 At least one entry controller is required outside the permit space into which entry is authorised for the duration of the entry operation.

4.6.2 Know the hazards that may be faced during entry, including the symptoms and consequence of exposure.

4.6.3 Be aware of the possible behavioural effects of hazard exposure in entrants.

4.6.4 Continuously maintain an accurate count of entrants in the permit space and ensure a means to accurately identify entrants.

4.6.5 **Under no circumstances** will they move away from the permit space, they must remain outside the permit space during entry operations until relieved by another entry controller as part of planned rest breaks. Handover, takeover of the confined space from entry controller to another must be completed and the team in the confined space must also be aware of the takeover.

4.6.6 Communicate with entrants as necessary to monitor entrant status and alert entrants of the need to evacuate.

4.6.7 Monitor activities inside and outside the space to determine if it is safe for entrants to remain in the space and orders the entrants to evacuate if: the entry controller detects a prohibited condition, detects entrant behavioural effects of hazard exposure, detects a situation outside the space that could endanger the entrants or if the entry controller cannot effectively and safety perform all the controller tasks.

4.6.8 Summon rescue and other emergency services as soon as the entry controller determines that entrants need the assistance to escape the permit space hazards and hand over all necessary information required to the Emergency Services.

4.6.9 Take the following action when unauthorised persons approach or enter the permit space while entry is underway:

a) Warn the unauthorised person that they must stay away from the permit space,

b) advise the unauthorised person that they must exit the space immediately if they have entered the space and inform the authorised entrants and the permit issuer.

4.6.10 Perform rescue roll as specified by the rescue plan.

4.6.11 Not perform duties that might interfere with the controllers' primary duty to monitor and protect the entrants.

4.6.12 Set up barriers and exclusion zones, including signage around the permit area

4.6.13 Check gas levels BEFORE entry and continuously during entry. The time between readings must be agreed with the lead entrant, these times will be dependent on sight of entrants and task in hand. These readings must be recorded on the Confined Space Entry Checklist/Card (See Appendices 5 and 6).

4.6.14 Confirm with the permit issuer and supervisor that all required isolations are in place and marked as such on the permit form. In some cases, one person might undertake more than one role acting as the permit issuer and supervisor.

4.7 Entrants shall:

4.7.1 Be authorised to enter by the permit issuer to enter the confined spaces and that they have received the required training.

4.7.2 Agree to use the proper equipment and observe the entry procedures and permit.

4.7.3 Know the hazards that may be faced during entry including information on the type of confined space, sign, symptoms and consequence of exposure.

4.7.4 Properly use and be trained in the equipment required for safe entry.

4.7.5 Communicate with the entry controller as necessary to enable the entry controller to monitor the status of the entrants and to enable the entry controller to alert entrants of the need to evacuate the space if necessary.

4.7.6 Alert the entry controller whenever the entrant recognises any warning sign of symptom of exposure to a dangerous situation, or any prohibited condition is detected.

4.7.7 Exit the permit space as quickly as possible whenever: a) the entry controller or permit issuer gives an order to evacuate b) the entrant recognises any warning sign or symptom of exposure to a dangerous situation c) the entrant detects a prohibited condition, or an evacuation alarm is activated.

4.7.8 Wear and use the stated PPE (detailed in the safe system of work) at all times to protect against the known hazards and risks.

4.8 Bottom Person (link) shall:

4.8.1 Under normal circumstances be the first one in the permit space and the last one out.

4.8.2 Visually checks the condition of the access and also the bottom chamber (if there is one).

4.8.3 Identify any additional hazards and keep the entry controller informed of these and any other entrants.

4.8.4 In addition to the checks that are carried out pre-entry they will check for any gas at the bottom of the permit area and immediately inform the entry controller.

4.8.5 Assess the entrance and the exit of the permit area and relay any hazards to any other entrants and also the entry controller.

4.8.6 Raises the alarm in an emergency and carries out a head count of all other entrants as they exit.

4.8.7 Communicate with the entry controller and relay messages from the entry controller to all other entrants.

Appendix 1 Detailed Specific Guidance

The basis for safety is best secured by avoiding the need to enter a confined space, therefore wherever possible work practices/areas/plant etc. should be modified to enable the work to be carried out from outside the confined space.

A1.1 Organising - Communication

Confined Space Register

A Confined Space register shall be maintained for each of the sites, with individual departments maintaining their own register (See appendix for register template to be used). No other templates will be used to record confined spaces. In addition, all departments must develop and maintain a map of each confined space and review this annually.

A Confined Space Register shall contain as a minimum:

- Confined Space Reference (unique and identifiable) See A1.5 – Signage
- Location
- CS Type (NC1, NC2, NC3, NC4 & NCx) See CS Classification
- Is the space entirely or substantially enclosed
- Inherent foreseeable specified risks

A1.2 Organising - Competence

Where it is not reasonably practicable to avoid entering a confined space to undertake work, the employer and/or contractor is responsible for ensuring a safe system of work is used. In designing a safe system of work, they shall give priority to eliminating the source of danger before deciding what precautions are needed for entry.

All personnel involved in the authorization, supervision and entry itself shall be trained based on the level of entry risk (See Appendix 6 Training Requirements)

All entrants will undertake training which includes the following elements:

- Definition of a confined space.
- Specified risks and the definition of.
- Duties under the Regulations, preventing the need for entry.
- Risk Assessment and hazard identification.
- Atmospheric hazards and gases
- Principles and use of gas detectors and understand the alarm settings
- Safe systems of work and permits to work
- Roles, responsibilities and Entry Controller duties
- Pre use Checks, correct donning and adjustment of harness
- Inspection and application of tripods, winches and fall arrest equipment.

- Practical exercises including traversing a Confined Space

In addition, those likely to be involved in any emergency rescue should be trained for that purpose.

Rescue arrangements will be set out in the safe system of work and the risk assessments and defined prior to entry.

Training will include:

- Likely causes of an emergency
- Use of rescue equipment e.g. tripod/winch
- Procedures to be followed when donning and using apparatus
- Checking of correct functioning and testing of emergency equipment
- Identifying defects and dealing with malfunctions and failures of equipment during use
- Works, site or other local emergency procedures including the initiation of an emergency response.
- Emergency first aid and resuscitation procedures
- Use of firefighting equipment
- Liasion with local emergency services in the event of an incident
- Rescue techniques

A1.3 Planning - General Principle

A risk assessment shall be carried out prior to entry (See Safety Code 06 – Risk Management) If the risk assessment identifies risks of serious injury from work in confined spaces, the Confined Space Regulations applies. The regulations contain the following key duties:

- Avoid entry into confined spaces, e.g by completing he task from the outside.
- If entry into a confined space is unavoidable, follow a safe system of work and put in place adequate emergency arrangements prior to work commencing.

Consider the following options as alternatives to enter Confined Space?

- Modify the confined space itself so that entry is not necessary
- Modify items within the confined space so they can be accessed, tested or monitored remotely (e.g. emergency lighting).
- Inspection, sampling and cleaning operations can often be done from outside the space using the appropriate tools and equipment.
- Remote cameras can be used for inspection of vessels, pits etc

If you need to enter a confined space, you will have a safe system of work and the necessary emergency arrangements. Use the results of the risk assessment to help identify the necessary precautions to reduce the risk of injury. These will depend on the nature of the confined space, the associated risk and the type of work involved.

Arrangements must be made that the safe system of work, including the precautions identified are developed and put into practice.

The safe system of work and the risk assessment will need to include all emergency arrangements for raising the alarm and carrying out rescue operations in an emergency. Each identified confined space will have Emergency arrangements they will depend on the nature of the confined space, the risks identified.

A1.4.1 Entry into a Restricted Access Space

A restricted space is an area where due to physical constraints and/or hazardous materials or plant, there is a need to control who enters.

All restricted areas must:

- Be clearly signed to indicate restricted access/authorised access only (where possible)
- Where appropriate, have additional signage to warn people of the hazard present e.g low/high voltage electricity, fragile ceiling etc
- Be kept locked when not occupied and have a system to identify when someone is in the space
- Be defined a NO lone working area. Where this is not possible, there must be a safe system of work (SSOW) in place, which will identify who is in the space and clear emergency procedures will be recognised as part of the SSOW.
- Have a relevant, up to date risk assessment (which will form part of the SSOW) and this will be communicated to all persons that enter the restricted space.

Confined Space Classification for a comprehensive list of confined spaces, please see the Confined Space Register, which will be developed, monitored and updated by each department.

Some places may become a confined space when work is carried out or materials introduced, or during their construction, fabrication or subsequent modification.

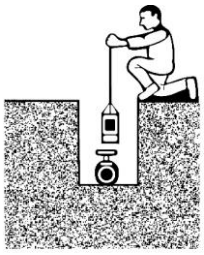
To align training and competency requirements, the classification system of the City and Guilds 6150 assessment scheme shall be used. The City and Guilds classification of low, medium and high-risk classification are explained briefly below. It should be noted that this classification system is based on the entry rather than the structure and assumes entry classification may change depending on the number of entrants, the distance travelled into a structure. The inherent risks, and the introduced/task-based risks.

Low Risk Confined Space Entries

Low risk is a shallow entry with adequate natural or mechanical ventilation, where access is simple and unobstructed and there is no likelihood of flooding. Examples within STFC are meter pits, valve chambers, seismic pits etc. If the operative is only

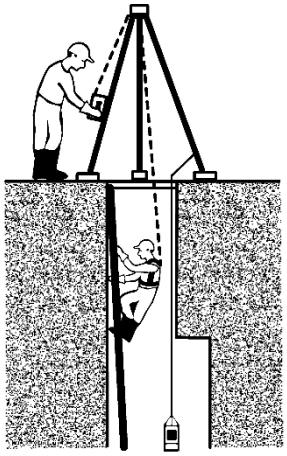
checking areas no deeper than 1200mm with east access openings using a gas detector where standing up on an alarm situation would render them safe.

For low-risk entries, breathing apparatus is not required, due to the risk of hazardous atmosphere is very low or the time taken to get out of the space would be less than the time taken to don an escape set. The use of winch and harness is not compulsory, and no on-site rescue provision is required.



Medium Risk Confined Space Entries

Medium risk is that entry where the operative is required to enter any tank, chamber or room that has restricted airflow but would expect the atmosphere to be safe due to the controls put in place. The use of a gas monitor, escape set, tripod, winch, harness and other associated confined space entry equipment shall be required. Where the entrant in direct unobstructed access with continuous attachment to the fall arrest/retrieval block or similar mechanical rescue device; the risk assessment and method statement should be able to demonstrate additional, on-site rescue provision is not generally required.



Where it is not possible to have an entrant permanently attached to a fall arrest/retrieval block or similar mechanical rescue device; there must be a rescue team available in the event of an emergency.

High Risk Confined Space Entries

High-risk entries are defined as those entries where full working breathing apparatus is required either because there is a known hazardous atmosphere or because the likelihood/risks associated with a hazardous atmosphere, occurring is significant. This may be due to intrinsic hazards within the space (i.e residues) or introduced hazards. Other hazards may include, the presence of heat, physical hazards (is awkward access, size restrictions etc) or other hazards may necessitate classifying the entry as high risk.



A1.5 Signage

Confined Space signs warn people that an area is considered a confined space.

All confined spaces will be visually identifiable by signage. All signage will need to comply with ISO 7010 and meet the Health and Safety (Safety Signs and Signals) Regulations 1996. (See below example)

All confined spaces will have the recommended signs (below) and carry the unique confined space number or ownership given on the confined space register. See A1.1

If it is not possible to place a sign near to or at the entrance to a confined space, a map will be produced by each department identifying where their confined spaces are located. This map will be accessible to all interested parties upon request.

Additional signage will include “Confined Space Emergency Exit Do not obstruct” to highlight areas that interlude along a defined confined space route or location.



A2.0 – Hazards

The hazards that the Confined Space Regulations address arise through the combination of the combined nature of the place of work and the possible presence of one or more specified risk, such as substances or conditions which, taken together, could increase the risks to the health and safety of people.

Remember: A hazard can be introduced to a substantially enclosed space that otherwise would be safe.

The most likely hazards are as follows (this list is not exhaustive)

Flammable substances and oxygen enrichment

A risk of fire or/and explosion can arise from the presence of flammable substances.

A risk of fire and explosion from an excess oxygen atmosphere.

A risk of explosion from the ignition of airborne flammable contaminants (dust cloud).

A fire or explosion can also be caused by leaks from adjoining plant/processes, or from pipes that run within an area.

A risk from fire or explosion may remain from previous processing/cleaning or from previous storage, or from sludge or other deposits that may be disturbed during cleaning.

Toxic gas, fume or vapor

Fumes may remain from previous processing or because of previous storage, or arise from sludge or other deposits disturbed, e.g. during cleaning.

Fumes may also enter the space from adjoining plant.

Fumes and vapor can also be produced from the work inside the confined space, eg. welding, flame cutting, use of solvents etc.

Oxygen deficiency

Oxygen deficiency may result from, for example:

(a) purging of the confined space with an inert gas

(b) naturally occurring biological processes which may consume oxygen

(c) vessel completely closed for some time, rust formation consumes oxygen

(d) the risk of increased levels of carbon dioxide from exertion (heavy breathing) or presence of compounds such as lime chippings

(e) buring operations and work such as welding and grinding which consumes oxygen

(f) displacement of air during pipe freezing, for example, with liquid nitrogen

(g) a gradual depletion of oxygen and entrants breathe in confined spaces.

The ingress or presence of liquids

Liquids can flow into the confined space and lead to drowning and other serious injury depending on the nature of the liquids such as corrosivity or toxicity. Within STFC Liquid Nitrogen is used widely and this material is capable of displacing sufficient oxygen to create an oxygen deficient environment in a small or insufficiently ventilated space, leading to the risk of asphyxiation.

Solid materials, which can flow

Free flowing solids can submerge a person, preventing breathing. Materials which create this hazard include sand, and any other substances in granular or powder form.

Presence of excessive heat

This can lead to a dangerous rise in core body temperature and can be made worse by personal protective equipment being worn. A slower heat build-up in the body can cause heat stress, and if action is not taken to cool, the body there is a risk of heat stroke and unconsciousness. This can occur where work in hot conditions is undertaken in a confined space or where, for example, boilers/furnaces have not been allowed sufficient time to cool before people are allowed to enter and undertake work, or where equipment or where equipment had been steam cleaned to remove hydrocarbons.

Excessive heat may also be seasonal, risk assessments will take this into account. The following mitigation measures will be considered.

Preventing and managing heat stress will include:

(a) Postpone work to a more suitable (cooler) time e.g from Summer to Winter.

(b) Conducting heat stress assessments in the confined space. Wet globe measurements can assist in this process.

(c) Training workers to identify and report heat stress symptoms

(d) Installing air-conditioning and ventilation systems to keep the air circulating and dissipate heat, this could be as simple as opening a controlled door an hour or so before entry (providing the required signage is in place and the necessary people have been informed)

(e) Personal Protective Equipment (PPE) may include protective cooling apparel.

A review of the PPE to be worn should be considering the effect of heat, e.g chemical suits may lead to a reduced entry time before rest breaks and forced ventilation increase.

A3.0 Implementation

Management of an Entry into a Confined Space

The following items shall be taken into consideration when carrying out a confined space entry.

Supervision

When STFC are using a 3rd party to manage a confined space entry, the contract-supervising officer (CSO) will ask contractors to provide details of competency. These details will be confirmed by the permit issuer who has overall supervisory responsibility. SC15 – Appendix 3 form can be used.

Communication

A communication system will be needed between those inside the confined space and those on the outside, (visual, verbal, walkie talkies etc) and a system to raise the alarm in an emergency.

The type of communication and method of raising an alarm must be risk based and identified on the risk assessment and detailed on the method statement and rescue plan.

Whichever communication method is chosen is should be tested. There are some parts of STFC sites which suffer from poor signal or interference, so testing communications is vital.

Fire/Explosion Risk

If confined space entry work is required in a hazardous area or hot work is required, the relevant permit must be completed before commencing work.

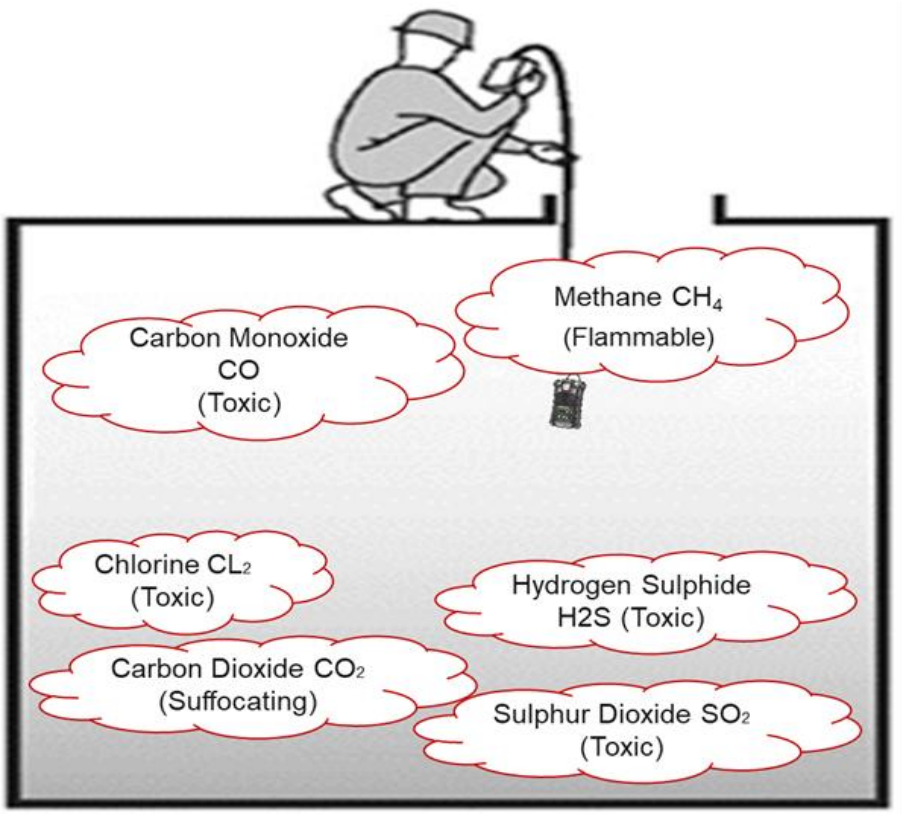
See SC20 (Controlling explosive and flammable gases and dusts) and SC32 (Fire and emergency management)

Note: Precautions may be needed to prevent static electricity hazards

Testing/Monitoring the atmosphere

The atmosphere within a confined space may need testing for hazardous gas. Continuous monitoring of the atmosphere must also be carried out to check that there is no change in the atmosphere while the work is being carried out, particularly where there is a known possibility of adverse changes in the atmosphere during the work.

Atmospheric testing for minimum oxygen content and monitoring for flammable gases may be needed. There may be more than one gas present, and the space will need to be tested at various levels as some gases are heavier than others. Typically, hydrocarbon vapours are heavier than air and logically they will tend to remain at the bottom of the space. However, with disturbance of the atmosphere, the vapour could be anywhere with pockets forming in corners. It is therefore necessary to take readings all over the space to give a comprehensive coverage and reasoned assessment that the space is safe for entry.



Testing of peak values for a duration of 10 minutes prior to entry is required.

Testing should be carried out by persons who are competent in the task and capable of interpreting the results. Recording of the results and monitoring of the process is documented on the STFC Permit to work and also the STFC Entry card, with frequency of testing clearly identified based on the risk assessment or as dictated by permit issuer. This is usually carried out at a 3min period.

The initial testing shall be carried out without entering the confine space, if by the nature of the space such as compartmentalization this is not feasible the entry shall be deemed high risk and specialist advice shall be sort.

Testing Stratified Atmospheres
When monitoring for entries involves a descent into atmospheres that may be stratified, the atmospheric atmosphere envelope is to be tested at approximately 1.5 meters in the direction of travel and to each side.

If a sampling probe is used the entry rate of descent is to be slowed to accommodate the sampling speed and detectors response rate.

Gas Purging
Where there is presence of flammable vapours, these will need to be purged by an inert gas to remove any flammable vapor. The purged gas will then need to be vented away from personnel. Care needs to be taken on where the gas is vented to and not to expose others to any harmful or flammable vapours. The atmosphere will need checking for oxygen content and elimination of flammable vapours.

Ventilation
Forced or extract ventilation may be needed to provide sufficient fresh air to replace the oxygen that is being used up by people working in the space, and to dilute and remove gas, fume or vapor produced by the work.

Lock out Tag Out

Lock out/Tag out (LOTO) is a control measure usually conducted in advance of planned maintenance or repair activity of a Confined Space.

The need for LOTO will have been identified through the risk assessment and in advance of a confined space entry. LOTO type will depend on the hazard identified and recorded within the permit to work.

Isolation from gases or solids

The recommended form of isolation for confined space entry is physical disconnection and blanking and should be carried out in all but the most exceptional circumstances. If this is not possible then additional control measures must be put in place to minimise the risks, such as using isolating spades or permanent atmospheric monitoring equipment

Isolation of mechanical equipment

The power should be disconnected, separated from the equipment and a check made to ensure isolation has been effective. Lock all other equipment, which by virtue of its potential energy can move, with a suitable chock or other blocking equipment

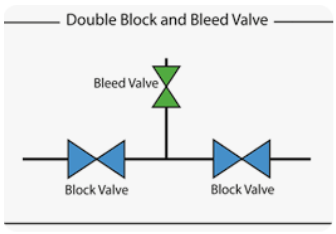
<u>Suggested types of mechanical isolation:</u>

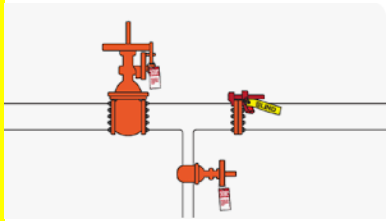
Breaking and blanking – Disconnect at the closest join to the vessel. Blank off open ends except those on the vessel. If possible, misalign pipework.

Only suitable for steam, water and some innocuous substance, as a failure will result in spillage outside the confined space.

All valves must be locked and labelled. The bleed must be proven to be clear. Automatic valves must NOT be used for isolation. Actuators should be removed where using automatic valves cannot be avoided.

Examples below of Double block and bleed and breaking and blanking systems.





Isolation of electrical equipment

Disconnect power from any electrical shock situation. Equipment must be isolated using lockable tags (see LOTO under SC34)

Any motors present in the area must be isolated by either choking or wedging moving parts, and wherever possible remove or disable remote controls from equipment.

Spading

Spading must only be used where breaking and blanking is technically difficult.

This is the isolation of a section of pipeline at a flanged joint without making significant pipeline alterations. This is normally if the isolation is temporary, but a positive isolation that cannot be achieved with a valve can be obtained.

You must ensure that you Spade at the closest joint to the vessel. This reduces the dead space in the pipelines where gases etc. can remain.

If any Spades are already in existence, they must not be relied upon without checking them first, this check must also include corrosion checks. You must also check that the Spade can withstand the maximum supply, expansion pressure and temperature behind it.

Example of a spade



Personal protective Equipment

All personnel protective equipment shall be specified during the risk assessment process for the work to be undertaken and shall be task specific based on the identified hazards.

All personnel protective equipment proposed shall be checked before start of the task to ensure it is fit for the purpose intended and is in good working order.

Access and Egress

The size of openings to confined spaces needs to be adequate.

If the opening into the confined space is below 575mm diameter minimum dimensions, then other precautions must be taken. See below.

Different criteria apply when the critical entry dimensions extend over a significant length or height, as in the case of sewers, pipes, culverts, small tunnels, and shafts. It is recommended that people should not normally enter sewers of dimensions smaller than 0.9m high by 0.6m wide.

Any other specialist methods of access used such as the use of ladders, tripod, winches etc. must be fit for purpose, in date and have the necessary paperwork.

Lighting

Ensure adequate and suitable lighting for the task and environmental conditions. Consider the possibility of a flammable atmosphere may be present and therefore all lighting equipment taken into the confined space must be Ex rated and have the correct zone rating – See SC20 for further details

Limited working time

There may be a need to limit the time that individuals are allowed to work iun a confined space. This may be appropriate where, for example, respiratory protective equipment is used, or under extreme conditions of temperature and humidity.

Suitability for work in a confined space

All personnel who will be working in and involved with the confined space entry shall be adequately trained and briefed. If the risk assessment requires a permit to work, then all personnel will have attended a confined space course (see training appendix).

Where the risk assessment highlights exceptional constraints from the physical layout, the competent person may need to check that individuals are of suitable build, and that they have no issues with claustrophobia etc.
All persons (employee or contractor) must have a valid confined space entry medical. Employees entering confined spaces will receive the medical clearance via the STFC Occupational Health department. See SC24 for further details.

Contractors must ensure that they have the required medical clearance and evidence of this must be verified by the permit issuer.

Emergency/Rescue

Regulation 5 of the confined space regulation states that:

“No person at work shall enter or carry out work in confined space unless there have been prepared in respect of that confined space suitable and sufficient arrangements for the rescue of a persons in the event of an emergency, whether or not arising out of a specified risk”

All Confined Space entries shall have a rescue plan, which will not be reliant on the emergency services.

A rescue plan, rescue team and equipment will be defined in the risk assessment and method statement for the work to be carried out and shall be agreed and briefed out to all parties concerned as part of the entry.

Types of rescue can be separated into four groups:

Self-Rescue: As an example, where an entrant is carrying a portable gas detector, the detector will alarm when the atmosphere is tending towards a hazardous state. This will give the entrant sufficient time to don an escape breathing apparatus set and in accordance with the prepared arrangements evacuate safely from the confined space.

Non-Entry Rescue: Where an entrant is working in a position where they can be hauled or pulled out of the confined space in an emergency, e.g. they can be rescued without the need for the rescuer to enter the confined space. For instance, where an operative is working directly below the access hatch. Where a non-entry rescue is not possible, (i.e. because there is more than one person in the space and there is a risk that recovery lines may become entangled, then it is suggested that the on-site recuse team should be on stand-by at the entry point.

Entry Rescue: When the need for an on-site rescue has been identified in the risk assessment, the team shall be made up of suitably trained and competent personnel, with full working breathing apparatus or escape set (this will depend on the level of risk of confined space) and all necessary rescue equipment, this will normally require third party assistance and resource. Where rescue teams are utilised, consideration should be given to always safeguarding the rescuers.

Public Emergency Services: In some circumstances, e.g., where there are prolonged operations in confined spaces and the risks justify it, there may be an advantage to prior notification to the emergency services (e.g. local fire and ambulance services) before the work is undertaken. If such notification is thought necessary, the emergency services should be consulted, and confirmation obtained about the information they will require. In all cases, arrangements must be in place for the rapid notification of the emergency services should an accident occur. On arrival, the emergency services should be given all known information about the conditions and the risks of entering and/or leaving the confined space before entering it to attempt a rescue. The information may also include the confined space entry checklist, readings taken, risk assessment and method statement.

Reliance on the emergency services alone will not be sufficient to comply with this regulation. STFC must put in place adequate emergency arrangements BEFORE the work starts.

Appendix 2 Confined spaces flow chart

2.1 Is the space a 'confined space'?



Appendix 3 Confined Space Risk Assessment Procedure

In the event that entry into a confined space cannot be avoided, a suitable and sufficient risk assessment must be carried out and a written safe system of work developed including the provision of emergency procedures.

Assessing the risks from entry

When assessing the risks, use must be made of all the information available about the confined space. All foreseeable hazards and risks must be considered in advance and the following issues may need consideration: -

Confined Spaces can include:

- some places which may only become confined spaces occasionally, such as rooms during fumigation;
- areas which may have open tops such as water tanks

The Assessment should include consideration of:

- The task;
- The environment;
- Communications;
- Mechanical and electrical isolation of equipment;
- Ventilation and purging;
- Materials, tools and lighting to be used;
- Competency of staff involved;
- Arrangements for rescue.

Associated Hazards may include:

- Previous contents, residues and contamination;
- Flammable substances or oxygen enrichment;
- Toxic gases, fumes or vapour;
- Oxygen deficiency;
- Physical dimensions;
- Ingress or presence of liquids;
- Solid materials which can flow;
- Presence of excessive heat;
- Electricity or static electricity;
- Cleaning chemicals;
- Work out of hours.

Any written risk assessment required by this code must be recorded in the Evotix Assure safety management system. Staff involved must be made aware of the results of any such assessment. Communication of the risk assessment must be carried out face to face with all persons involved in the Confined Space entry.

In gathering information for an assessment, managers may need expert advice. Information on confined spaces is available from the HSE website at http://www.hse.gov.uk/confinedspace/ or from the SHE Group.

Safe working in a confined space or in areas where there is likely to be danger from a gas or vapour, or where there is likely to be a deficiency of oxygen, depends entirely on a strict adherence to a well-devised system of precautions.

It is essential that these precautions be followed without exception on every occasion.

One sure way to do this and communicate the information is to have a written statement of 'Safe System of Work' SSoW.

References and further reading

STFC Safety Code No 6	Risk Management
Health and Safety Executive	Safe work in confined spaces (Confined Spaces Regulations 1997) Approved code of practice and guidance L101
Health and Safety Executive	Safe work in confined spaces INDG258
Health and Safety Executive	HSG253 Safe Isolation of Plant and Equipment
Health and Safety Executive	Management of health and safety at work (Management of Health and Safety at Work Regulations 1999)
Health and Safety Executive	Safe use of work equipment (Provision and Use of Work Equipment Regulations 1998)
Health and Safety Executive	Personal protective equipment at work (Personal Protective Equipment at Work Regulations 1992)
Health and Safety Executive	Control of substances hazardous to health (Fifth edition) The Control of Substances Hazardous to Health Regulations 2002 (as amended)

Appendix 4

SAMPLE RISK ASSESSMENT FOR FUEL OIL VESSEL ENTRY

Title: Entry into a vessel for the purposes of inspection. The vessel has been used for the storage of heavy fuel oil.		Assessed By: J Bloggs	Date of Assessment: 1/4/7/07			
Step 1 What are the hazards?	Step 2 Who might be harmed and how?	What are you already doing?	Step 3: What further action is necessary?	Step 4: How will you put the Assessment into action?		
Hazard/Task or Situation				Action by whom	By when	Done
Vessel will contain flammable gas	Staff who will prepare the vessel and the staff who will carry out the examination. Also others in proximity to the work location may be affected. The hazards exist during the preparation of the vessel for entry and during the subsequent examination.	Tests are carried out to ensure the vessel is properly earthed to discharge any static electricity. The inside of the vessel is force ventilated with air from a portable air blower. Any flammable gas is vented to atmosphere away from any sources of ignition or incentive sparking.	Staff carrying out the examination and on standby are trained in confined space entry.			
Residue left after the vessel has been drained may contain pockets of toxic gas	—ditto—	Oxygen level and toxic/flammable gas levels are measured prior to entry, from the outside using a calibrated instrument. (Identify instrument and gases being tested for, i.e. oxygen deficiency,				

		combustible gas or toxic gas) The operative entering the vessel carries a calibrated portable gas detector				
Electrical heaters are located in the vessel. There is no natural lighting inside the vessel	—ditto—	Pipelines, incoming and outgoing are isolated by means of spectacle blinds. Power to the electrical heaters is isolated and the switchgear locked off. The padlock key is held with the vessel entry permit to work. All temporary lighting is of a low voltage approved type				
Air flow is restricted	—ditto—	The inside of the vessel is force ventilated with air from a portable air blower. Any flammable gas is vented to atmosphere away from any sources of ignition or incendive sparking.				
Height is restricted	—ditto—					
Skin can be contaminated by the hydrocarbon residue	—ditto—	The drain valve is opened, the vessel drained of any remaining contents, and any residue disposed of appropriately. The inside of the vessel is washed down from the outside using a high-pressure water jet and detergent. Personal protective equipment is worn				
Entry manhole is restricted in width and situated one and a half metres above ground level	—ditto—	A platform is erected to afford easy access to the manhole				

Rescue would be difficult.	—ditto—	A standby man is always at the entry to the vessel. Two way communication is maintained by means of radio	Arrangements are in place for contacting Emergency Services. (The telephone number of the emergency services is programmed into a mobile telephone held by the standby man)			
How will the findings of this assessment be communicated to staff involved in task:		Operatives have been involved in the risk assessment process and in the identification of risk control measures to develop the safe system of work. **Work will be carried out under a "confined space permit"**				
If the risk is significant, has it been entered into the Evotix Assure database?		Yes ☐ No ☐ Evotix Assure Ref No:				
Step 5 Review Date:		▪ Review your assessment to make sure you are still improving, or at least not sliding back. ▪ If there is a significant change in your workplace, remember to check your risk assessment and where necessary, amend it.				

Appendix 5 STFC - Confined Space Entry Checklist

https://www.she.stfc.ac.uk/wp-content/uploads/2026/10/SC11-Confined_Space_Entry_Checklist.docx

Appendix 6 Confined Space – Entry Card

https://www.she.stfc.ac.uk/wp-content/uploads/2026/10/SC11-Confined_Space_Entry_Card.docx

Appendix 7 Confined Space - Permit to Work

https://www.she.stfc.ac.uk/wp-content/uploads/2026/10/SC11-Confined_Space_Permit_to_Work_Template.docx

Appendix 8

SAMPLE SAFE SYSTEM OF WORK for entry into a vertical shaft/tank

Consideration has been given to work being carried out from outside the confined space and has been considered not to be feasible. The following safe system of work must be adhered to as it has been developed from the risk assessment carried out.

1. Receive task and the appropriately trained person will issue an STFC Permit to Work.
2. Ensure that the STFC Confined Space Entry Checklist has been carried out, filled in and all required signatures are in place and ensure that any Emergency Equipment that is to be 'kept ready' is checked and any testing is carried out prior to entry.
3. Use plans and records, such as piping and instrumentation diagrams, DSEAR assessments etc. of the shaft/tank (determine if there is any potential for ingress of liquid).
4. All pipelines to and from the tank/shaft will be isolated (See section 2.0 on Lock Out Tag Out - LOTO)
5. Any internal mechanical or electrical equipment (e.g. pumps) will isolated and locked off. This will be done under a permit and verified.
6. All liquid remaining in the shaft/tank will be pumped out and cleaned prior to entry.
7. Check for any previous reported defects or gas alerts.
8. Check that the tank is securely earthed to ensure any static electricity is discharged safely (Check that all earthing system maintenance is in date)
9. Check the weather conditions (external entries)
10. Ensure that all team members have been briefed on the task and any potential hazards and including the safe system of work (including the Permit to Work, STFC Confined Space Entry Checklist and the STFC Confined Space Entry Card)
11. Carry out all pre-use checks on all equipment to be used. (Any equipment used in a flammable atmosphere will need to be in line with the DSEAR assessment and correctly, Ex rated for the zone)
12. Check that all communication equipment is in good working order BEFORE ENTRY and all users are aware correct use (if a flammable atmosphere, the equipment will need to be in line with the DSEAR assessment and correctly Ex rated for the zone.
13. Make the area safe using barriers, signage etc.
14. Ventilate the confined space - by means of atmospheric ventilation or mechanical (if required). Care will be taken to ensure that the atmosphere being discharged to is clear and no hazards will be introduced.
15. Check location of any manhole steps and ensure that these can be seen clearly.
16. Testing of peak values for a duration of 10 minutes prior to entry is required.
17. Switch on gas detector and lower to test the atmosphere for at least 10 minutes before entry. Record all results on the STFC Confined Space card.
18. Withdraw the gas detector from the shaft/tank, record results and return to the space.
19. First entrant to descend on a winch or fall arrest recovery system will check the manhole steps for any defects.

20. Entry controller will ask for a gas reading and ensure this is recorded. In the event of any gas alarm, all entrants will don the escape sets and leave the space immediately.
21. In the event of the operative inside the vessel not responding to radio contact or not appearing after the alarm from the portable gas detector has sounded, the on-site emergency team will be alerted, and they will either carry out an entry rescue or raise the alarm to summon the emergency services.
22. If manhole steps are OK, the second member (if more than one member is entering) can descend. All entrants will need to be attached to a fall arrest system. If only one entrant entering, they will stay attached to the line.
23. Communications from the entrant/s to the entry controller should be maintained every 3 minutes. All test results to be recorded. If the entrant leaves the confined space for any reason, all times need to be recorded on the STFC Confined Space Entry Card. When re-entering ensure gas readings are taken prior to entry (from point 15)
24. When the task is complete, last person to exit should be connect to the line.
25. Remove all remaining equipment from the space.
26. Close and secure space and remove any barriers/signage.
27. Report any issues/problems.
28. STFC Permit to Work - Section 6. Clearance to be signed off by the permit issuer and acceptor.

NB In the event that the work is not completed within the time identified by the confined space permit to work, the entrant will leave the shaft/tank and the means of access/egress will be secured to prevent any unauthorised entry until a new confined space permit has been issued.

Appendix 9 **Training Requirements**

Role	Initial Training	Refresher	Frequency
Confined Space Awareness	1 Day	1 Day	3 Years
Arco Professional Safety Services, https://www.arcoservices.co.uk/training/courses/confined-space-awareness/			
CS Entrants	See Arco's website	See Arco's website	3 years
Entry into Confined Spaces (Risk depending on the profile of space) Low, Medium, High. https://www.arcoservices.co.uk/training/course-type/confined-spaces/			
CS Permit Issuers	1 day	1 day	3 Years
"Arco Professional Safety Service, https://www.arcoservices.co.uk/training/courses/confined-space-awareness-with-permit-writing/			

Appendix 10 Audit Checklist

Ref.	Item	Rating	Comments
1 (Section 4.2.2) (Appendix 3)	Has a risk assessment and method statement been carried out?		
2 (Section 4.2.5)	Has supervision been provided in accordance with the above risk assessment?		
3 (Section 4.2.5) (Appendix 9)	Have all employees working in and around the confined space been adequately trained and has evidence been seen?		
4 (Section 4.2.6)	Has the Confined Space Entry Checklist been completed and retained for a period of 3 years after the entry? Have all tests been recorded at defined intervals listed?		
5 (Section 4.2.2)	Is the STFC Confined Space permit to work system in place for all persons working in confined spaces?		
6 (Section 4.3.6)	Is all equipment used in confined spaces intrinsically safe and holding a current test certificate?		
7 (Section 4.3.2)	Has safe access and egress been provided for the confined space?		

Appendix 11 – Confined Space Register Template

https://www.she.stfc.ac.uk/wp-content/uploads/2026/10/SC11-Confined_Space_Register_Template.docx

Appendix 12 Document Retention Policy

Records Established	Minimum Retention Period	Responsible Record Keeper	Location of Records	Comments / Justification
Confined Space Permits	Current + 5 years	Line management/Confined Space Permit Issuer	Local records systems	
Confined Space Entry Checklist	5 years	Line management/Confined Space Permit Issuer	Local records systems	
Confined Space Entry Card	5 years	Line management/Confined Space Permit Issuer	Local records systems	
Appointments:				
Confined Space Permit Issuer	Most Recent	Director	SHE Directory	