



Science and  
Technology  
Facilities Council

# **WORK IN CONFINED** **SPACES**

STFC Safety Code No 11

Rev. 1.7, Issued December, 2022

## 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 Assurance	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

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# STFC

## CONFINED SPACES CODE

### 1 Purpose

On average 15 people a year are killed in the UK during work in confined spaces and more are seriously injured. 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.

The Confined Spaces Regulations 1997 are in place to protect staff and others against risks to their health while working in a confined space.

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, users, contractors and tenants working in confined spaces within STFC.

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

**Confined Space:** means any place such as ducts, vessels, culverts, tunnels, boreholes, manholes, excavations, sumps, inspection pits, experimental hatches, tanks, building voids or other similar space in which, by virtue of its enclosed nature there is a reasonably foreseeable risk of:

- serious injury from fire or explosion;
- loss of consciousness arising from increased body temperature;
- loss of consciousness or asphyxiation arising from gas, fume, vapour or lack of oxygen;
- drowning arising from increased levels of liquid; or
- asphyxiation from a free flowing solid.

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. [See Appendix 1 for a ‘confined space’ decision tree.](#)

## **4 Responsibilities**

### **4.1 Line Managers and Supervisors shall:**

- 4.1.1 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 2 and 3 for guidance on carrying out such assessments and for a completed example.
- 4.1.2 Ensure that, prior to entry into a confined space, a written safe system of work, including emergency procedures, has been developed (see Appendix 4 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 5 and 7.
- 4.1.3 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.
- 4.1.4 Ensure all staff who will enter a confined space are fit to do so. See SHE Code 24, Health Surveillance and Health Screening Medicals.
- 4.1.5 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 5).

### **4.2 Confined space permit to work issuers shall:**

- 4.2.1 Only issue confined space permits where they are competent to do so having successfully completed training defined in Appendix 5. 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.
- 4.2.2 Assess all associated risks involved in the entry into a confined space, develop a safe system of work and issue a confined space permit, ensuring all necessary precautions, including emergency procedures, are taken, see Appendix 2, 3, 4 & 7.
- 4.2.3 Oversee the issue of any permit and its cancellation and check safety at each stage of the work.

### **4.3 Employees, users, contractors and tenants shall:**

- 4.3.1 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.
- 4.3.2 Inform line management of any known health issues that may preclude them from working in a confined space.

4.3.3 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*).

**4.4 Directors shall:**

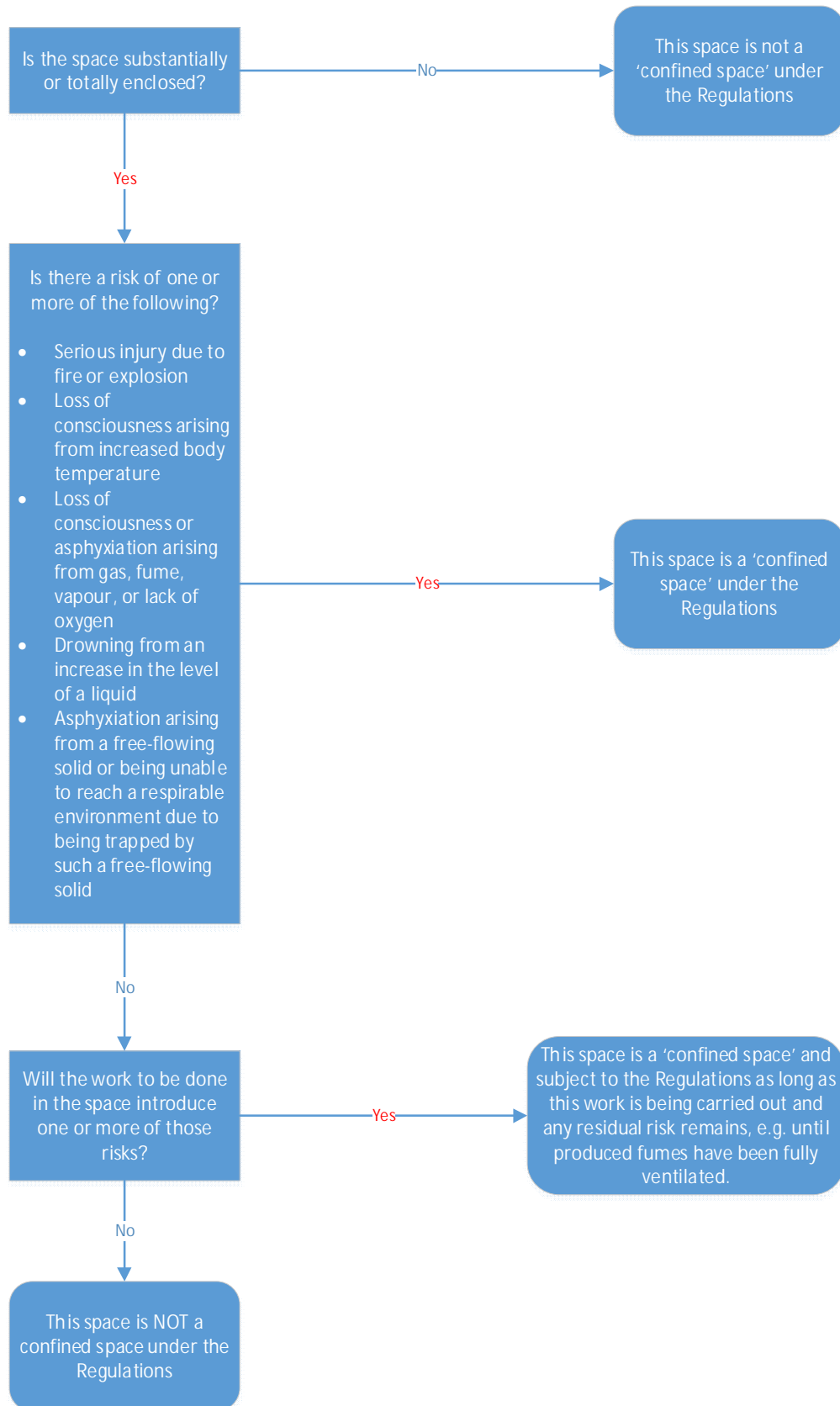
4.4.1 Ensure that only competent persons are authorised as “confined space permit to work issuers”; see Appendix 5 for training requirements. The appointment should be recorded in SHE Directory where the geographic/equipment scope of the appointment should be defined.

**4.5 SHE Group shall:**

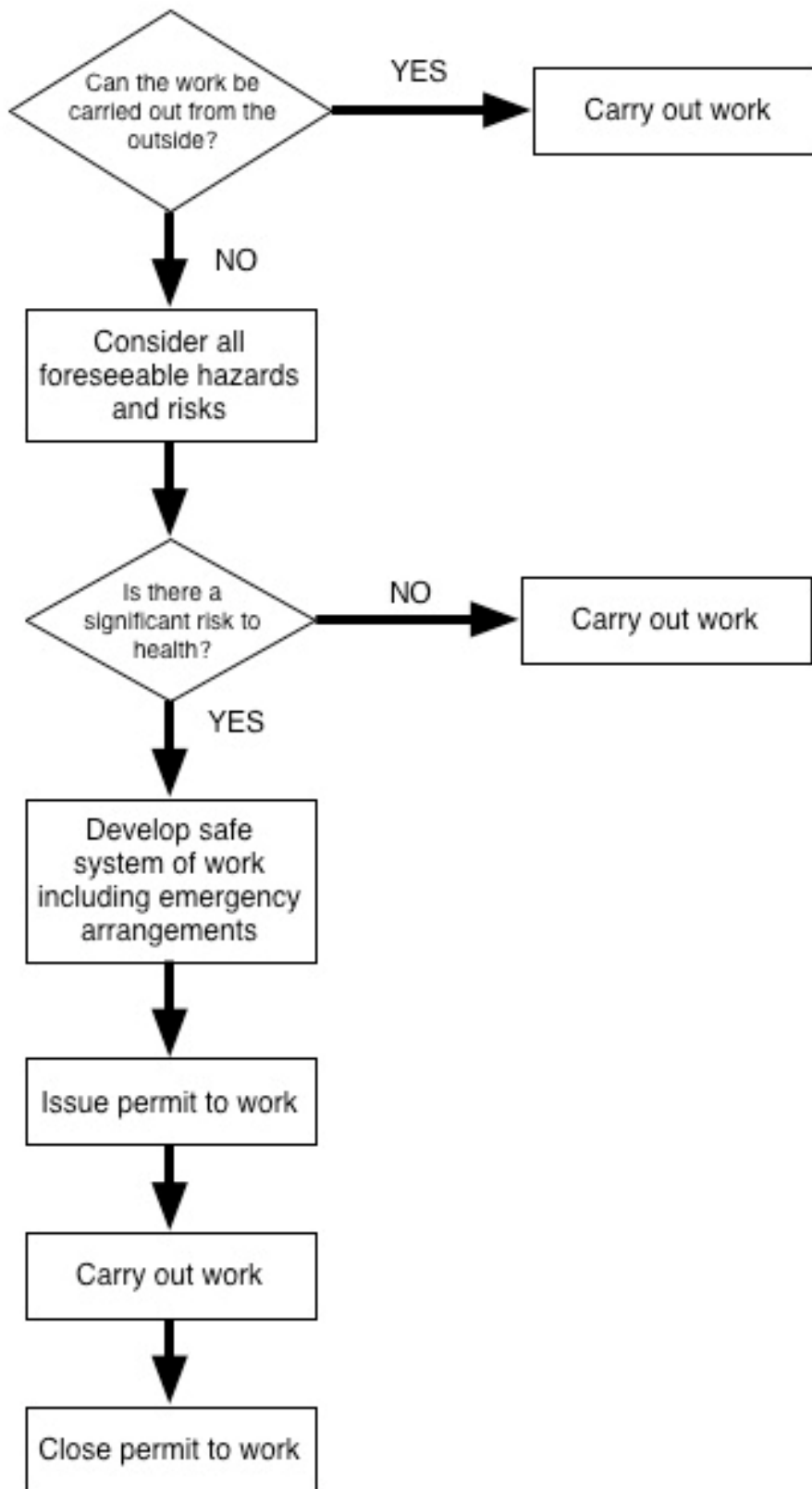
4.5.1 Maintain and make available to staff a list of authorised persons competent to issue confined space permits.

## Appendix 1 Confined spaces flow charts

### 1.1 Is the space a 'confined space'?



## 1.2 Process flow chart





## Appendix 2 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.

### 2.1 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.

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.

## 2.2 Developing a Safe System of Work

In the development of a written safe system of work, the information gathered during the risk assessment will be used to construct a document that will give information and instruction to the employees who are to carry out the work including safe means of access and egress.

This will include all of the risk control measures and the reasons for their application. e.g. the need for forced air ventilation to ensure oxygen levels are maintained and a comfortable working temperature.

It will also detail the means for preventing unauthorised access when there is no need for anybody to access the confined space, and the means of emergency evacuation will also be documented.

## **2.3 References and further reading**

STFC Safety Code No 6	Risk Management
Health and Safety Commission	Safe work in confined spaces (Confined Spaces Regulations 1997) Approved code of practice and guidance L101
Health and Safety Executive	<a href="#">Safe work in confined spaces INDG258</a>
Health and Safety Commission	Management of health and safety at work (Management of Health and Safety at Work Regulations 1999) Approved code of practice and guidance. L21
Health and Safety Commission	Safe use of work equipment (Provision and Use of Work Equipment Regulations 1998) Approved Code of Practice and Guidance L22
Health and Safety Executive	Personal protective equipment at work (Personal Protective Equipment at Work Regulations 1992) Guidance on regulations L25
Health and Safety Executive	Control of substances hazardous to health (Fifth edition) The Control of

Substances Hazardous to Health  
Regulations 2002 (as amended)  
Approved code of practice and  
guidance L5

## Appendix 3

### 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 incendive 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	—ditto—	A standby man is always at	Arrangements are in place for			

difficult.		the entry to the vessel. Two way communication is maintained by means of radio	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. <b>Work will be carried out under a “confined space permit”</b>					
If the risk is significant, has it been entered into the Evotix Assure database?	Yes <input checked="" type="checkbox"/> No <input checked="" type="checkbox"/> Evotix Assure Ref No:					
Step 5 Review Date:	<ul style="list-style-type: none"> <li>▪ Review your assessment to make sure you are still improving, or at least not sliding back.</li> <li>▪ If there is a significant change in your workplace, remember to check your risk assessment and where necessary, amend it.</li> </ul>					

## Appendix 4

### SAMPLE SAFE SYSTEM OF WORK FOR FUEL OIL VESSEL ENTRY

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. All pipelines to and from the vessel will be isolated by means of spectacle blinds and any internal mechanical or electrical equipment will be isolated and locked off, (see piping and instrumentation and electrical drawings for locations).
  2. A check will be made to ensure that the vessel is securely earthed to ensure any static electricity is discharged safely.
  3. The drain valve will be opened and facilities put in place to contain all residues washed out of the vessel. (Identify means of disposal.)
  4. An entry/exit platform will be erected, to enable easy access and egress from the manhole.
  5. The vessel will be opened by removing all covers and vented to atmosphere by means of an external air blower fan and supply hose. Care will be taken to ensure that the atmosphere being discharged is clear of any sources of ignition or incendive sparking. (Identify location.)
  6. The external air blower fan will provide forced ventilation at all times to ensure the level of oxygen is maintained and a comfortable working temperature.
  7. Care will be taken regarding the location of the blower to ensure it draws in no contaminants.
  8. The interior will be washed down using high pressure washers and detergent, paying special attention to the base of the vessel where hydrocarbon sludge or residue may collect. (As for item 3.)
  9. A portable gas detector will be tested in the open air to ensure it is functioning and then the atmosphere in the vessel will be tested for residual hydrocarbon gas and oxygen content. This operation will be carried out from the outside using a probe attached to the intake of the instrument. (Identify type of gas detector.)
10. Emergency escape equipment will be positioned and tested, in readiness, prior to a confined space permit to work being issued. (List types of equipment.)
11. Two trained individuals will undertake the work, they will be familiar with and understand the hazards and control measures identified by the risk assessment. They will have been suitably trained and authorised for confined space work. (Name the individuals and cross refer to the confined space permit)
12. They will be familiar with the emergency escape equipment and be wearing personal protective equipment (PPE) suitable for the work to be carried out. One will be on standby outside the vessel and the other will enter the vessel to carry out the work. (List types of PPE.)
13. The operative entering the vessel will wear a harness attached to a lifeline and hoist.
14. Suitable low voltage explosion proof lighting will be provided to illuminate the interior of the vessel while work is being carried out.

15.The operatives will be in radio contact with each other at all times.

16.On ensuring that all conditions of the permit to work for confined spaces entry have been met.

The confined space permit will be issued by the relevant Line Manager or Supervisor who must be familiar with the conditions of work.

17.The operative entering the vessel will take the portable gas detector with him into the vessel along with the emergency breathing apparatus.

18.In the event of an audible alarm signal from the portable gas detector he will don the emergency breathing apparatus and leave the vessel.

19.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, a rescue attempt will be made by the standby man after the alarm has been raised using the pre-programmed mobile phone to summon the emergency services.

20.On completion of the work, the operative will leave the vessel.

21. The work completion section of the confined spaces permit to work will be filled in and the permit handed back to the supervisor for cancellation.

22.The drain will be closed, the entry manhole closed and all isolations removed ready for the vessel to be put on line.

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



## Appendix 5 Training Requirements

<b>Role</b>	<b>Initial Training</b>	<b>Refresher</b>	<b>Frequency</b>
<b>Staff entering Confined Space</b>	2 day	1 Day	3 Years
"Entry into Confined Space" - Phoenix Safety Services Ltd; CSTS Warrington Ltd; Total Access (UK) Ltd			
<b>Supervisors/Line Managers</b>	1 day	1 day	3 Years
"Awareness for Supervisors" - Phoenix Safety Services Ltd; CSTS Warrington Ltd; Total Access (UK) Ltd			
<b>CS Permit Issuers</b>	1 day	1 day	3 Years
"Managing Confined Space Entry" - Phoenix Safety Services Ltd; Total Access (UK) Ltd			

## Appendix 6 Audit Checklist

Ref.	Item	Rating	Comments
1 (Section 3.1) (Section 4.1.2) (Appendix 2)	Has a risk assessment been carried out?		
2 (Section 4.1.7)	Has supervision been provided in accordance with the above risk assessment?		
3 (Section 4.1.5) (Appendix 3)	Have all employees working in and around the confined space been adequately trained?		
4 (Section 4.1.4) (Section 4.1.7)	Is there a record of air tests carried out before staff work in confined spaces?		
5 (Section 4.1.7)	Is a permit to work system in place for all persons working in confined spaces?		
6 (Section 4.2.1)	Is all equipment used in confined spaces intrinsically safe and holding a current test certificate?		
7 (Section 4.4.1)	Has safe access and egress been provided for the confined space?		

**Appendix 7 Sample Confined Space Permit to Work**

**Permit to Work in Confined Spaces or Dangerous Atmospheres**

Site/Building/Area..... Exact location: .....

Job Details:.....

This permit is only valid when all sections are complete. If you are in doubt or don't understand, then please ask. *Please ensure that you sign this permit to work.* Do not proceed with your work until your permit has been authorised by the relevant member of staff.

By accepting this permit you agree to the requirements of the STFC Confined Spaces Code.

**HAZARDS TO BE AWARE OF AND PRECAUTIONS TO BE TAKEN**

	Yes	No	N/A
Are you qualified /trained to undertake this work?			
The confined space has been isolated from all connected pipework			
The confined space has been purged with steam/water/air			
The confined space is electrically isolated and locked out			
The confined space is mechanically isolated and locked off			
The confined space is below 30°C on full cooling			
Is the entrance big enough to allow access and egress in an emergency?			
Supply of respirable air assured/ventilation required?			
Means of access to and escape from the confined space is acceptable?			
Is breathing apparatus at hand and in good working order?			
Is the safety line/tripod/harness and any other back up equipment to hand?			
Are there adequate emergency arrangements in place?			
Trained standby person at point of entry?			

**ATMOSPHERE TEST REQUIRED**

TIME OF TEST:		Acceptable conditions	Result	
Oxygen	%	>19.5% & <23.5%	Pass/Fail	
Carbon Monoxide	%	<30ppm	Pass/Fail	
Carbon Dioxide	%	<5000ppm	Pass/Fail	
Flammability	%	<10% of LEL	Pass/Fail	
Other (specify)	%	See EH40 for WELs	Pass/Fail	

Other precautions required:

Other safety equipment required:

Type of power tools and lighting permitted:

**PREPARATION COMPLETE. ACCEPTANCE AND AUTHORISATION**

I verify the above location has been examined, the precautions on the checklist have been taken, and that permission is authorised for this work. I also accept responsibility for the work to be carried out.

Person responsible for work: ..... Signed: .....

Authorised Permit Issuer: ..... Signed:.....

Date and Time: ..... Time of Expiry: .....

<b>EXTENSION</b>			
Permit extended to:		Signature of Authorised Permit issuer	Any additional precautions to be taken
Time	Date		

**HAND BACK AND CANCELLATION PROCEDURES**

I confirm that the work has been completed/partially completed, checked by myself and the area left in a safe and tidy condition. (Please delete accordingly)

Person responsible for work: ..... Date and Time: .....

I have inspected the finished work and hereby cancel this permit.

Authorised Permit Issuer: ..... Date and Time: .....

## Appendix 8 Document Retention Policy

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