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Confined Spaces

Health and Safety Compliance Standard

Document Control

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1. Purpose

This compliance standard establishes methods to be implemented to reduce the risks associated with work in confined spaces and to comply with the legal requirements of *The Confined Space Regulations 1997*.

The University will implement *Water UK – The Classification and Management of Confined Space Entries Occasional Guidance Notes* for its management of confined spaces.

2. Scope

This compliance standard applies to all activities taking place within a confined space.

Any high risk (NC4) confined spaces will be outsourced to an external specialist

Business Units (BU) must implement the requirements of this document across their areas.

3. Definitions

Confined Space - Any place, including any chamber, tank, vat, silo, pit, pipe, sewer, flue, well or other similar space, in which, by virtue of its enclosed nature, there arises a reasonably foreseeable specified risk.

By this definition, any enclosed area has the capability of becoming a confined space, if one or more of the 'specified risks' are introduced into that area.

Specified Risks:

- Loss of consciousness or asphyxiation of any person arising from gas, fume, vapour or the lack of oxygen.
- Serious injury from a fire or explosion caused by the presence of flammable substances or residues.
- Drowning through an increase in the level of liquid.
- Asphyxiation arising from a free flowing solid or the inability to reach a respirable environment due to entrapment by a free flowing solid.
- Loss of consciousness arising from an increase in body temperature caused by the persons work rate or the temperature within the confined space itself.

Free Flowing Solid - any substance consisting of solid particles, and which is of, or is capable of being in, a flowing or running consistency, such as grain, sand, or other similar material.

NC1 - A low risk confined space exits where there is easy entry/exit and natural ventilation.

NC2/NC3 – A medium risk confined space exists where there are access issues; a realistic expectation of encountering a specific risk; possible introduction of specified risks during the work activity.

NC4 - A high risk confined space exists when there is a specified hazard that cannot be controlled or eliminated.

The legal requirements regarding confined spaces are defined in the Confined Space Regulations 1997.

4. Roles and Responsibilities

Heads of Business Units (BUs) – responsible for ensuring that this compliance standard is implemented within their BU by appointing one or more Confined Space Appointed Person and Responsible Person to co-ordinate the control of confined spaces activities across the BU. Heads of BUs shall ensure that there are sufficient resources in place so that confined spaces can be identified, classified, risk assessed, and controlled and all staff involved in confined space activities are suitably trained and competent.

Before any task deemed as a confined space can take place, the following key appointments must be made:

Confined Space Appointed Person – responsible for producing, maintaining, and updating safe systems of work including emergency arrangements and related documents associated with confined spaces to maintain compliance with current legislation, best practice and available training courses.

Responsible Persons (i.e. Managers, Supervisors) – responsible for the planning and coordination of all confined space operations on site required in accordance with this compliance standard to ensure that confined space operations can be delivered safely through a suitable and sufficient risk assessment. They are responsible for ensuring all those entering a confined space have received suitable training and health surveillance and all members of the entry team hold a safety critical medical certificate.

Entry Controller (Medium/High Risk Only)- is responsible for managing access to the confined space ensuring the entry area is set up safely, and verifying that

equipment is checked and recorded before use. They must also document gas monitor readings before and during work, track the entry and exit times of all members of the entry team, and maintain communication with the **Entry Team**. In the event of a gas monitor alarm or other emergency, the **Entry Controller** must record the time of the alarm, ensure that all members of the entry team are safely evacuated, coordinate first aid from another member of the team and emergency services are called if required.

Entry Team – shall follow the safe system of work for the safe entry into the confined space and wear or use any equipment as intended for their health and safety. They should not enter the confined space if they are not satisfied with the controls in place.

5. Training Requirements

All personnel working in direct connection to the confined space must have attended an approved confined space entry training course where they are trained in the hazards, equipment and safety precautions related to confined space entry work.

Role	Minimum Qualifications
Confined Space Appointed Person	C&G 6160-06 Level 4 – Plan, Manage and Review Legislative and Safety Compliance for Work in Confined Spaces (or equivalent)
Responsible Person	C&G 6160-05 Level 3 - Supervising Teams Undertaking Work in Confined Spaces (or equivalent)
Entry Controller	C&G 6160-09 Level 2 – Entrant and Entry Controller for Medium Risk Confined Spaces (or equivalent) 3 Day First Aid at Work
Entry Team (Low Risk – NC1)	C&G 6160-01 Level 2 - Working in Low Risk Confined Spaces (or equivalent) First Aid 1 Day Emergency First Aid at Work
Entry Team (Medium Risk – NC2/3)	C&G 6160-02 Level 2 - Working in Medium Risk Confined Spaces (or equivalent) 1 Day Emergency First Aid at Work
Rescue Team Supervisor	C&G 6160-07 Level 3 - Direct Emergency Rescue and Recovery of Casualties from Confined Spaces (or equivalent).
Rescue Team Member	C&G 6160-08 Level 3 – Working as a Member of a Rescue and Recovery Team in Confined Spaces
UON Staff or PGRs – if identified via risk assessment	Confined Space Awareness

All Confined Space Personnel	Must have Safety Critical Medicals
Contractors / Subcontractors	Must comply with the training requirements specified above

All training certificates must be within their expiry date and valid for the operations that are to be carried out.

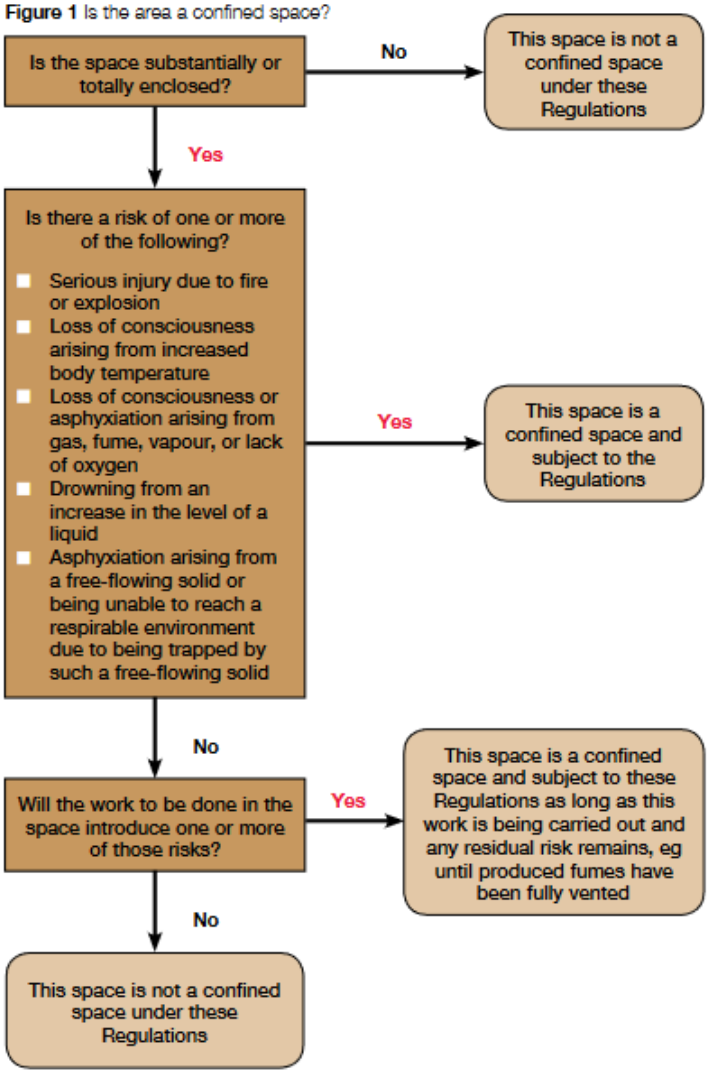
Works planned to take place in a high risk confined space (NC4) shall be outsourced to a specialist contractor. Advice shall be sought from the Health and Safety Department before selecting a contactor.

6. Identification and Classification of Confined Spaces

6.1. Identification

The **Responsible Person** shall arrange for a walk-through tour of their facilities, both internally and externally, and determine which areas are confined spaces using the following flow chart. Refer to Appendix A guidance for on confined space identification.

Figure 1 Is the area a confined space?



HSE, L101, safe work in confined spaces

The **Responsible Person** shall create a *SAF-FOR-002a Confined Spaces Register* detailing the reference number, description, location, photograph, specified hazards of all confined spaces within the Business Unit.

Where confined spaces have been identified within a Business Unit, the **Responsible Person** must appoint a trained and competent **Confined Space Appointed Person** to manage these. *(Note – this can be the same individual)*

6.2. Classification

The **Confined Space Appointed Person** shall assist the Business Unit with the classification of all their confined spaces in line with the below table. Alternatively, Business Units can arrange for a specialist contractor to classify their confined spaces (The Business Unit may contact the central Health and Safety Department for advice when selecting a contractor).

The **Confined Space Appointed Person** or specialist contractor should follow the *Water UK Occasional Guidance* Note when classifying confined spaces. There are four different national classifications of Confined Spaces:

NC1 Low Risk	NC2 Medium Risk	NC3 Medium Risk	NC4 High Risk
A low risk confined space exists where there is easy entry/exit and natural ventilation.	A medium risk confined space exists where there are access issues; a realistic expectation of encountering a specific risk; possible introduction of specified risks during the work activity.		A high risk confined space exists when there is a specified hazard that cannot be controlled or eliminated.
Low risk, shallow entry with adequate natural or mechanical ventilation, where access is simple and unobstructed and there is no likely risk of flooding. Examples: meter pits, valve chambers	Vertical direct unobstructed access with continuous attachment to a man riding hoist or similar mechanical rescue device. Escape Set (Self Rescue) breathing apparatus required to be taken into medium risk	When it is not possible to have persons permanently attached to a safety line. Usually, it will be a team entry which moves away from the entry point. Examples: Man entry sewers, utility service subway tunnels, aqueducts and complex wet walls. Working without an attached rescue line and includes working away from the point of entry. Escape Set (Self Rescue) breathing apparatus required to be taken into medium risk and complex wet walls. Working without an attached rescue line and includes working away from the point of entry.	Nonstandard entries involving complex operations which introduce additional risks and require specific controls and rescue arrangements. Examples: mechanical hazards, physical complexity of system introduced hazards, enhanced specific intrinsic hazards. Full breathing apparatus (working) required to be worn at all times in high risk. High risk entries require the presence of personnel who have designated responsibilities for dealing with emergencies

The **Confined Space Appointed Person** shall add the classifications to the Confined Spaces Register.

The **Confined Space Appointed Person** shall maintain the Confined Spaces Register.

7. Confined Space Operations

7.1. Safe System of Work

The **Responsible Person** will create a specific risk assessment, explore eliminating the need for confined space entry, and consider using CCTV surveys and other remote-controlled devices. Failing this, consideration should be given to

declassifying the space to the extent where the occurrence of the specified hazards can be eliminated.

If access to the confined space cannot be avoided, then the **Responsible Person** in consultation with the **Confined Space Appointed Person**, must develop a safe system of work to achieve safe entry to the area and consider:

- The method of entry to, and egress from the area.
- The specified risks ensuring that confined space entry is safe and without risk to health.
- The equipment needed for authorised personnel to safely enter the confined space.

A safe system of work shall be developed for each separate confined space regardless of classification and signed off by the **Confined Space Appointed Person.**

After the approval of *SAF-FOR-002b Safe System of Work*, the **Responsible Person** shall issue a Confined Space Permit for the safe entry into medium risk confined space (NC2 or above).

The **Responsible Person** and the **Entry Controller** must be satisfied that all pre-cautions and controls are in place before allowing entry into the confined space.

7.2. Operational Control Procedures

During the planning stage of the confined space operation, consideration must be given to the isolation of any services that may affect the confined space. (i.e., physically lock off any flow valves or discharge pipes).

The space may also need to be cleaned to remove any hazardous residues prior to entering the area. Confirmation of any such cleaning work or isolations must be recorded and signed off on the relevant confined space entry permit.

If the gas monitor emits an alarm during the initial testing, then no-one is permitted to enter, and additional venting may be required. After this time the initial testing must be repeated and if the alarm emits again, the work must be suspended, the confined space must be closed and the **Responsible Person** informed.

Once the **Responsible Person** or **Entry Controller** is satisfied that the conditions for the confined space entry have been met and that all the equipment has been supplied and is in good working order, and that the confined space has been suitably isolated, the permit can be signed off as authorising the work to commence and this will be handed to the person entering the confined space. The confined space work

can then be carried out in accordance with the requirements of the method statement.

Upon successful completion of the confined space entry works, confirmation must be received that all personnel, plant and equipment have been withdrawn from the area before the permit is signed off and handed back to the issuing person, the **Responsible Person** shall check that this is the case before cancelling the permit.

Minimum Requirements

The below controls must be adhered to and detailed in *SAF-FOR-002b Safe System of Work*

NC1 Low Risk	NC2 Medium Risk	NC3 Medium Risk	NC4 High Risk

• Suitable and sufficient risk assessment reviewed by the Confined Space Appointed Person.
• Suitable and sufficient emergency rescue plan in place.
• All those entering the confined space must have a valid low risk confined space training certificate.
• 1 Day Emergency First Aid at Work Certificate.
• Suitable first aid equipment (which may include the need for specialist resuscitation equipment) must be on hand at the point of entry for use in an emergency. A fully trained first aider must be available throughout the works.
• The confined space must be opened and allowed to vent for a minimum period of 15 minutes. Barriers and warning signage must be positioned to keep people away from the area.
• Gas monitor requirements to be assessed and implemented if necessary. If the initial atmosphere
	All those entering the confined space must have a valid medium risk confined space training certificate.
	
	All NC1 controls will apply, in addition to:
	• Safe Entry of Confined Space to be controlled under Permit-to-Work.
	• Provision of Gas Monitoring:
	  ○ Minimum of gas monitor at point of works.
	  ○ The atmosphere within the area must be tested. A suitable intrinsically safe gas monitor capable of monitoring the suspected conditions and gases within the space should be remotely placed into the space (i.e. lowered in on a rope or placed in via a pole). The atmosphere must be tested in 3 areas of the confined space (normally top, middle, and bottom) for a minimum of 5 minutes per location and recorded.
	  ○ Gas monitor must have a valid calibration date.
		All those entering the confined space must have a valid medium risk confined space training certificate.
		
		All NC2 controls will apply, in addition to:
		• Suitable and sufficient emergency rescue plan in place, which may include on-site rescue team
		• Provision of gas monitoring (in addition to the above):
		  ○ Personal cell gas monitor worn (this must be a minimum of 4 cell).
		• 3 Day First Aid at Work trained personnel.
		• Forced air ventilation as required.
		• Safety harness and line warn by all those entering the confined space, where practical.
		• An access and retrieval tripod and winch may be required if there is a vertical access into the confined space. Where this is used each person entering the confined space must be attached to this
			University of Nottingham will not undertake any works in a high risk confined space. If this is required, then a specialist contractor will be procured to carry out these works.

testing proves clear, then preparations to enter the confined space can begin. • No entry controller required providing those entering the NC1 confined space are provided with suitable means of communication and easy means of entry/exit. • Entry operative health assessed to safety critical worker standard. • Safety briefing for those entering delivered the Responsible Person or some trained and competent in working in low risk confined spaces. • Good lighting and communications as required • All equipment must be in working order and supplied with its last certificate of test. • Provision of Personal Protective Equipment (PPE) suitable for the environment they will be entering such as waterproof overalls with sealed joints for entry into sewerage systems)	○ Monitoring of the atmosphere within the confined space must be carried out continuously whilst personnel are carrying out work within the confined space. • Entry Controller must always be present at the point of entry. • Breathing apparatus escape sets must be provided for all persons entering the confined space. • Harnesses must be provided for all persons entering the confined space. An access and retrieval tripod and winch may be required if there is a vertical access into the confined space. Where this is used each person entering the confined space must be attached to this when entering the area. Those entering the area must remain attached to the winch line. • Provision of suitable means of entry/exit where this not already provided. • Provision of suitable task lighting. • Provision of clear means communication. • All electrical equipment brought into the confined space must be intrinsically safe, and activities such as cutting or welding must not generate sparks unless the conditions to eliminate the likelihood of fire or explosion have been met.	when entering the area. Those entering the area must remain attached to the winch line. If this cannot be achieved (i.e. because 2 or more people are in the space, then the winch line can be supplemented using a suitable rescue line.	

8. Emergency Procedures and Rescue Arrangements

The **Responsible Person** must ensure that suitable rescue arrangements and facilities are available throughout the duration of the confined space entry work. The exact nature of the facilities will be determined through the safe system of work and will be communicated to the team conducting and overseeing the work.

If a gas monitor should emit an alarm tone (no matter what the cause) whilst work is being carried out in the confined space, then all staff within the confined space will immediately don their escape breathing apparatus and make their way to the exit point in preparation to evacuate the confined space.

The **Entry Controller** will co-ordinate the rescue arrangements in cases where there is a problem with vacating the team from the area. Once the team have successfully vacated the space, the access must be sealed, and the matter investigated.

If there is an incident within the confined space, then the following steps need to be taken:

- If the casualty is alert and able to move, they should be encouraged to reach the access point so they can be connected to the retrieval winch and lifted out of the area. If the injured individual is immobile or cannot be moved, please contact rescue services for assistance with their evacuation; or
- If the casualty is unconscious due to an injury or has been incapacitated by gas, and the gas monitor sounds an alarm, all other individuals in the confined space must put on their escape breathing apparatus leave the area immediately.
    - Under no circumstances should they attempt to rescue the casualty, as this could result in additional casualties. Emergency rescue services, equipped with self-contained breathing apparatus, should be contacted to recover the casualty, typically the fire and rescue service.

All gas alarm activations that occur during confined space entry work must be reported on the Incident Reporting System as a Near Miss.

All incidents that occur during confined space entry work must be reported on the Incident Reporting System to ensure that they are investigated where required.

9. Associated Documents, Appendices and Resources

- Confined Space Regulations 1997
- L101 ACOP Safe work in confined spaces
- Water UK – The Classification and Management of Confined Space Entries Occasional Guidance Notes
- SAF-FOR-002a Confined Space Register
- SAF-FOR-002b Confined Spaces Safe System of Work Template
- SAF-FOR-006b Confined Space Permit

Appendix A - Guidance on Confined Space Identification

For something to be deemed as a confined space it must have both of the following features:

- a space which is substantially (though not always entirely) enclosed; and
- one or more of the specified risks must be present or reasonably foreseeable.

The identification of confined spaces may not always be easy, and a confined space may **NOT**:

- Be enclosed on all sides – it may have an open top or side such as an excavation.
- Be small and/or difficult to work in – it may be very large such as cold storage.
- Be difficult to get in or out of – some may have several entrances and exits, and others may have large openings or are apparently easy to escape from such as laboratories.
- Be a place where people do not regularly work – some confined spaces such as those use for welding in workshops are used regularly by people in the course of their work.

There will be spaces that are not usually considered to be a confined space and may become one if there is a change in the conditions inside or change in the degree of enclosure or confinement, which may occur intermittently.

For example, an enclosed space may be free of contaminants and have a safe level of oxygen but the work to be carried out in it may change this such as:

- Welding that would consume some of the oxygen.
- A spray booth during paint spraying.

In these cases, the space may be defined as a confined space only while that work is ongoing and until the level of oxygen recovers or the contaminants have dispersed by ventilating the area.

Some confined spaces may be created deliberately, for example reduced oxygen (hypoxic) environments, where the oxygen level is depleted either by reducing the oxygen concentration or increasing the concentration of another gas such as nitrogen. Examples of where hypoxic environments are created include libraries for archives and manuscripts to prevent ignition of fires.

Some spaces may meet the criteria when they are used to store certain specific items. For example:

- a store of gas cylinders (carbon dioxide, argon etc) held in an enclosed space such as a laboratory (which if discharged would affect the atmosphere sufficiently to represent a specified risk).
- a store of material used as part of a fire suppression system (which would represent a specified risk if discharged).