UNIVERSITY OF BATH HEALTH & SAFETY STANDARD					
Confined Spaces					
Version Number	Version 3	Date of Approval	December 2022	Review Date	Three years from acceptance by the UHSC
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Aims	The University recognises the risk of working in confined spaces and the difficulty & complexity of controlling these risks. The aims of this standard are: 1. To eliminate or reduce the number of confined spaces 2. To eliminate or reduce the need to work in confined spaces 3. To manage the risks associated with confined spaces where such working cannot be avoided.				
Scope	This standard provides a practical means of meeting the requirements of the Confined Space Regulations 1997. Other legislation may apply to confined space work dependant on the circumstances. For example, work with hazardous substances, hot work and requirements to wear specific personal protective equipment could apply. However, these, and any other, additional requirements fall outside of the scope of this standard.				
Relevant Legislation	• Health & Safety at Work Act 1974 • The Confined Spaces Regulations 1997 & Approved Code of Practice				
Definitions	A "confined space" means any place, including any chamber, tank, vat, silo, pit, trench, pipe, sewer, flue, well or other similar space in which, by virtue of its enclosed nature, there arises a reasonably foreseeable "specified risk" A "specified risk" means one or more of the following risks • serious injury to any person at work arising from a fire or explosion; • the loss of consciousness of any person at work arising from an increase in body temperature; • the loss of consciousness or asphyxiation of any person at work arising from gas, fume, vapour or the lack of oxygen; • the drowning of any person at work arising from an increase in the level of liquid; or • the asphyxiation of any person at work arising from a free flowing solid or the inability to reach a respirable environment due to entrapment by a free flowing solid. Examples of specified risks are provided in Appendix 1. It is not sufficient for a work space to be enclosed to be defined as a "confined space". Under the Confined Spaces Regulations 1997 the workspace must be substantially (although not always entirely) enclosed & one or more of the specified risks must be present or be reasonably foreseeable. A workspace may be a "confined space" permanently. Equally, a workspace may be a "confined space" intermittently due to changes in the degree of enclosure or the temporary presence of one of the "specified risks" introduced as a result of specific activities.				
Responsibility for implementation	Director of Campus Infrastructure Heads of Department				
Training availability:	Advice on training requirements for Confined Space working is available from UHSE.				

Standard to meet		Accountability	Reference documents & more information
1	Departments have identified any foreseeable confined spaces (permanent or intermittent) within their area of control. Departments have identified activities that might foreseeable create a confined space. It is recognised that some confined spaces may not become apparent until particular works are scoped or planned.	Director of Campus Infrastructure Head of Department	See Appendix for further guidance on identifying confined spaces
2	Departments use a permit to work system to manage entry into a confined space. Note, Permit to Work systems are not required for Research Work which may give rise to a specified risk within an enclosed space.	Director of Campus Infrastructure Head of Department	Consult the University policy & guidance for permit to work information.
3	Department have completed a risk assessment for each identified confined space (i.e. all permanent and intermittent confined spaces).	Director of Campus Infrastructure Head of Department	The University's Risk Assessment standard should be followed.
4	Departments have identified control measures to reduce the risks associated with confined space working. Control measures should aim in the first instance to eliminate the need for confined space working either by addressing the enclosed nature of the work space or eliminating the specified risks that are present.	Director of Campus Infrastructure Head of Department	Control measures should be implemented in accordance with the University's Risk Assessment Standard.
5	Where work in confined spaces is unavoidable, Departments have implemented appropriate control measures including safe systems of work, appropriate alarms systems and emergency arrangements as identified in the risk assessment.	Director of Campus Infrastructure Head of Department	
6	All people required to work in confined spaces are competent to do so (i.e. have the necessary skills, experience, training and aptitude). Suitable and sufficient resources and equipment are made available, such that the work can be carried out safely and foreseeable emergencies dealt with. This would include equipment required to rescue someone who requires assistance when working in the confined space (for example, appropriate breathing equipment or rescue hoists).	Director of Campus Infrastructure Head of Department	
7	Where departments lack the necessary competence or resources or equipment, including appropriate resources and equipment to deal with emergencies, then a suitably competent and resourced contractor must be appointed to complete the confined space work.	Director of Campus Infrastructure Head of Department	The University's Management of Contractors Policy and procedures are followed. See Appendix for Liaison with Contractors
8	Departments have liaised closely with the contractors appointed to undertake confined space work to agree the arrangements for managing and monitoring the work. Departments keep records of the arrangements agreed upon. Departments store their records locally following their own local arrangements.	Director of Campus Infrastructure Head of Department	See Appendix for a model agenda for liaising with contractors

Standard Monitoring & Measurement Criteria	
Departmental arrangements for the management of confined spaces will be monitored through the department inspection process.	
1	Department can demonstrate that it has identified all confined spaces & produced risk assessments that address them. A sample of risk assessments will be examined.
2	Department can demonstrate that it has taken steps to eliminate or reduce confined spaces where this is practicable. A sample of risk assessments will be examined.
3	Department can demonstrate that it has taken steps to avoid or reduce the need to work in confined spaces. A sample of work & maintenance plans pertaining to confined space work will be examined.
4	Department can demonstrate that when confined space cannot be avoided then those undertaking the work are competent and adequately resourced to do so. Training records will be examined.
5	Where a department lacks the competence and resources to carry out any required confined spaces working then they have appointed a competent contractor to do the work on their behalf. Department can demonstrate that it liaised fully with the contractor beforehand to agree the arrangements & that records were kept of the arrangements agreed. A sample of liaison records will be examined.
6	Department can demonstrate that permits to work have been used to control entry to confined spaces where coordinating activities between the University & contractor is essential (e.g. where the University agrees to complete necessary isolations). A sample of permits to work will be examined.

Appendix 1: Confined Spaces & Specified Risks

Consult the Health & Safety Executive publication Confined spaces A brief guide to working safely INDG258(rev1) for further information

It is not sufficient for a work space to be enclosed to be defined as a "confined space". Under the Confined Spaces Regulations 1997 the work space must be substantial (although not always entirely) enclosed & one or more of the specified risks must be present or reasonably foreseeable.

A "confined space" means any place, including any chamber, tank, vat, silo, pit, trench, pipe, sewer, flue, well or other similar space in which, by virtue of its enclosed nature, there arises a reasonably foreseeable "specified risk".

Some confined spaces are enclosures with restricted openings & may be easily identifiable. Examples might be storage tanks, silos, reaction vessels, enclosed drains & sewers. Some confined spaces may be less obvious, but can be equally dangerous. Examples might be open topped chambers, vats, ductwork & unventilated or poorly ventilated rooms. It is not possible to give a comprehensive list of confined spaces.

A "specified risk" is one or more of the following:	Examples of the circumstances that might create the "specified risk" are:
Serious injury to any person at work arising from a fire or explosion	Examples might be: • Presence of flammable substances • Excess of oxygen in the atmosphere e.g. a leak from an oxygen cylinder • Presence of chemicals that can combust or spark in enriched (or in some cases normal) oxygen levels • Ignition of airborne flammable contaminants such as flour dust • Leaks from adjoining plant or processes that have not been effectively isolated
The loss of consciousness of any person at work arising from an increase in body temperature	Hot conditions can lead to a dangerous rise in core body temperature & this can be made worse by wearing PPE, highly physical or strenuous work, or working at a high work rate. In extreme cases heat stroke & unconsciousness can result. Examples might be: • Boilers or furnaces have not been allowed sufficient time to cool before entering to undertake maintenance work • Confined space is exposed to the sun or another heat source • Equipment has been steam cleaned to remove hydrocarbons • Hot work is being carried out, e.g. welding
The loss of consciousness or asphyxiation of any person at work arising from gas, fume, vapour, or the lack of oxygen	Examples might be: • Purging the confined space with an inert gas to remove flammable or toxic gas, fume, vapour or aerosols • Naturally occurring biological or chemical processes consuming oxygen e.g. fermentation during brewing • Leaving a vessel completely closed or poorly ventilated for some time (particularly one constructed of or containing items made from steel as rust formation consumes oxygen) • Burning operations & work such as welding & grinding which consume oxygen • Displacement of air during pipe freezing e.g. with liquid nitrogen • Gradual depletion of oxygen as workers breathe in confined spaces & where provision of replacement air is inadequate

A "specified risk" is one or more of the following:	Examples of the circumstances that might create the "specified risk" are:
	• A deliberate reduction in the oxygen level, designed to inhibit fire (e.g. in archives, libraries & IT server rooms).
The loss of consciousness or asphyxiation of any person at work arising from gas, fume, vapour, or the lack of oxygen	Examples might be: • Previous processing or storage in the space, e.g. fumigation, decaying material • Sludge or other deposits, for example when disturbed by cleaning • From adjoining plant that has not been effectively isolated or from exhausts of equipment being used, e.g. generators for lighting • The work being done, such as: welding, flame cutting; brush & spray painting, or moulding using glass-reinforced plastics; use of adhesives or solvents; or from the products of combustion • Plant failure, e.g. ammonia if refrigeration plant fails or carbon dioxide following leaks from compressed gas cylinders • Naturally occurring biological processes producing toxic gases in sewers, storage tanks, storm water drains, wells, slurry pits etc or produced as a result of fermentation in sealed silos where crops are stored • Build-up in some spaces, such as sewers or manholes, due to contaminated ground or leaks from behind vessel linings, rubber, lead, brick etc • Actions outside the space, for example due to hot work (e.g. welding on the exterior surfaces) or from equipment outside the space (e.g. exhaust fume from mobile plant, petrol-driven pumps, ventilation equipment or generators)
The drowning of any person at work arising from an increase in the level of liquid	Liquids can flow into the confined space & lead to drowning, for example the ingress of liquid when working in sewers or from other plant which has not been adequately isolated
The asphyxiation of any person at work arising from a free flowing solid or the inability to reach a respirable environment due to entrapment by a free flowing solid	Free-flowing solids can submerge a person, preventing breathing. Materials which create this hazard include grain, sugar, flour, sand, coal dust & other substances in granular or powder form. In a confined space the risk is increased because there is no space for the material to flow away

Hazards within confined space	Department to report the presences of significant known hazards within the confined space. Examples might be: • Flammable materials • Toxic or poisonous materials • Asbestos • Etc
Suitable & sufficient risk assessment completed & recorded	Seek assurances that a suitable & sufficient risk assessment has been completed & recorded. The risk assessment includes consideration of • the task; • the working environment; • working materials and tools; • the suitability of those carrying out the task; • arrangements for emergency rescue Seek assurance that a safe system of work has been devised in order to implement the findings of the risk assessment.
Supervision of the confined space work	Seek assurances that a suitable supervisor will be appointed & present during the work. Supervisors should be given responsibility to make sure that the necessary precautions are taken, to check safety at each stage & may need to remain present while work is underway.
Persons are suitable for the work to be undertaken	Seek assurances that the people who undertake the work are suitable. The people undertaking the work should have sufficient experience of the type of work to be performed.
Isolation of equipment & the confined space	Confirm what isolations need to be performed, who is to complete them & what checks are to be made to confirm they are effective. A permit to work may be needed to confirm that isolations have been completed & tested. Mechanical & electrical isolation of equipment is essential if it could otherwise operate, or be operated, inadvertently. If gas, fume or vapour could enter the confined space, you need to isolate the pipework. In all cases, a check should be made to ensure isolation is effective.
Cleaning or purging before entry	Confirm what cleaning or purging needs to be performed before entry, who is to complete this & what checks are to be made to confirm they have been effective. A permit to work may be needed to confirm that cleaning & purging has been completed & tested. This may be necessary to ensure fumes do not develop from residues etc while the work is done.
Check the size of the entrance	Confirm that the entry point is of sufficient size to allow safe access & egress (bearing in mind that the operators may be wearing bulky personal protective equipment). Confirm that the entry point is of sufficient size to allow effective emergency evacuation & emergency rescue.
Check provision of ventilation	Seek assurance that suitable ventilation will be provided for the duration of the work.

	You may be able to increase the number of openings & therefore improve ventilation. Mechanical ventilation may be needed to make sure there is an adequate supply of fresh air. This is essential where portable gas cylinders & diesel-fuelled equipment are used inside the space because of the dangers from build-up of engine exhaust. Warning: carbon monoxide in the exhaust from petrol-fuelled engines is so dangerous that use of such equipment in confined spaces should never be allowed.
Testing the air	Seek assurances that suitable air testing will be carried out before entry & whilst the work is being performed Testing the air may be necessary to check that it is free from both toxic & flammable vapours & that it is fit to breathe. Testing should be carried out by a competent person using a suitable gas detector which is correctly calibrated. Where the risk assessment indicates that conditions may change, or as a further precaution, continuous monitoring of the air may be needed.
Provision of special tools & lighting	Seek assurances that suitable work equipment & lighting will be used. Non-sparking tools & specially protected lighting are essential where flammable or potentially explosive atmospheres are likely. In certain confined spaces (eg inside metal tanks) suitable precautions to prevent electric shock include use of extra low voltage equipment (typically less than 25 V) and, where necessary, residual current devices.
Provision of breathing apparatus	Seek assurances that suitable breathing apparatus will be used where necessary Breathing apparatus is essential if the air inside the space cannot be made fit to breathe because of gas, fume or vapour present, or lack of oxygen. Never try to 'sweeten' the air in a confined space with oxygen as this can greatly increase the risk of a fire or explosion
System of work includes suitable emergency procedures	Seek assurances that suitable emergency procedures are in place & the contractor is able to implement them. Emergency arrangements will need to cover the necessary equipment, training & practice drills. The arrangements must include the University arrangements for summoning the emergency services to the campus. When things go wrong, people may be exposed to serious & immediate danger. Effective arrangements for raising the alarm & carrying out rescue operations in an emergency are essential. Contingency plans will depend on the nature of the confined space, the risks identified & consequently the likely nature of an emergency rescue. Emergency arrangements will depend on the risks. You should consider communications & rescue & resuscitation equipment.
Permit to Work	Agree with the contractor what permits to work might be necessary. The contractor will require a permit to work to confirm actions taken by the University (e.g. isolating services). The contractor will issue its own permit to work with respect to those aspects of the job within its own control

Risk Assessment Guidance

Identification of general and specific hazards that will require additional consideration for persons working in confined spaces

#	Hazard(s)	How people working in confined spaces might be affected	Required controls & measures
1	Permanent confined space not identified. Work performed near or in the confined space without necessary control measures	All persons working near or inside the confined space Staff & contractors performing maintenance work most at risk	• Department to identify permanent confined spaces – consult the guidance in the standard **& Confined Space Regulations 1997 Approved Code of Practice & Guidance L101** for further information
2	Intermittent confined space not identified. Work performed near or in the confined space without necessary control measures	All persons working near or inside the confined space Staff & contractors performing maintenance work most at risk	• Department to identify enclosed spaces that might become a confined space intermittently o Department to consider changes to the degree of enclosure o Department to consider activities that might give rise to one of the specific risks
3	Permanent confined space identified, but suitable precautions not identified	All persons working near or inside the confined space Staff & contractors performing maintenance work most at risk	• Department to produce a risk assessment for each permanent confined space identified. • Department to prioritise the elimination of confined spaces where reasonable. Possibilities are: o Change the enclosed space so it is no longer a confined space o Eliminate or reduce the specific hazards so it is no longer a confined space Where a number of confined spaces are broadly the same in terms of conditions, activities & control measures, then a generic assessment is acceptable

#	Hazard(s)	How people working in confined spaces might be affected	Required controls & measures

4	Intermittent confined space identified, but suitable precautions not identified	All persons working near or inside the confined space
		Staff & contractors performing maintenance work most at risk
			• Department to produce a risk assessment for each intermittent confined space identified
			  ○ Risk assessment to consider degree of change to enclosure
			  ○ Risk assessment to consider activities that create the specific risk
			• Department to prioritise the elimination of confined spaces where reasonable. Possibilities are:
			  ○ Change the enclosed space so it is no longer a confined space
			  ○ Eliminate or reduce the specific hazards so it is no longer a confined space
			• Where a number of confined spaces are broadly the same in terms of conditions, activities & control measures, then a generic assessment is acceptable

5	Work to be performed within the confined space, but can be done without entering the space
	Suitable precautions not identified
	Operators might enter the space during the work
		All persons working near or inside the confined space
		Staff & contractors performing maintenance work most at risk
			• Department to produce a risk assessment for work outside of the confined space
			• Identify measures to avoid work in confined spaces.
			  ○ Modify the confined space so that entry isn't necessary
			  ○ Perform the work remotely from outside the confined space
			• Work only to be performed by competent staff. Competence includes understanding the risks and the need not to enter the space under any circumstances
			  ○ If competent staff not available, then competent contractor to be appointed
			  ○ If required equipment not available, then competent contractor to be appointed or equipment rented

#	Hazard(s)	How people working in confined spaces might be affected	Required controls & measures
6	Work to be performed within the confined space, but cannot be performed without entering Not reasonable to eliminate the confined space Not reasonable to perform the work without entering	All persons working near or inside the confined space Staff & contractors performing maintenance work most at risk	**The University does not have the expertise or equipment to safely perform work in confined spaces. Competent contractors to be appointed** • Work to be arranged to reduce the need to enter the confined space • Competent contractor to be appointed • Department to liaise with contractor to agree the arrangements & keep a record of the arrangements agreed – see Appendix for a model agenda • Entry to confined spaces to be subject to a permit to work where liaison between the contractor & Department(s) essential (e.g. confirming isolation by the University)