THE UNIVERSITY OF SHEFFIELD

GUIDANCE NOTE

WORKING SAFELY IN CONFINED SPACES
Working Safely in Confined Spaces

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2. Executive Summary

   Work in confined spaces causes about 15 deaths each year in the UK. A confined space is somewhere which is substantially enclosed (so that one couldn’t escape easily), and where there is significant possibility for serious injury by asphyxiation, poisoning or drowning. University staff and students might have to enter confined spaces such as: - drains and sewers; silos; tunnels; boilers; large reaction vessels etc.

   The Confined Spaces Regulations 1997 oblige the University to ensure that entry to confined spaces is prevented and restricted to those occasions where the work cannot be easily done any other way. Before entry, a risk assessment must be carried out. This will determine the ‘safe system of work’ and appropriate emergency and rescue arrangements.

   Since it is University policy to comply fully with such duties, Heads of Management Units where such work goes on must ensure that the requirements of the Regulations are discharged within their own area of responsibility, and that their policy on confined spaces is incorporated into their local safety arrangements. Individual staff who organize, arrange or lead such work must acquaint themselves with, and act upon, the requirements of the local safety arrangement in force in their unit. The effectiveness of these arrangements will be monitored periodically by staff of the University’s Health & Safety Department.

3. Introduction

   For the University, the Health and Safety at Work etc. Act 1974 (the ‘Act’) is central, and demands that our activities avoid injury, or hurt to its staff, students and visitors. These duties were enlarged in 1992 by the Management of Health and Safety at Work Regulations (known colloquially as the ‘Management Regulations’). The Management Regulations require that the risks arising from work are actively managed in a logical, effective and measurable manner. The best ‘tool’ for this is risk assessment, and this is nowadays routinely found as an obligation on employers in all new safety law. Subsidiary ‘topic’ Regulations tell employers to focus on a particular safety issue, and deal with it in a particular way.

   The Confined Spaces Regulations 1997 (the "Regulations") are, in part, the result of a review of current safety legislation especially those involving a high risk of death or injury. Each year there are about 15 deaths in confined spaces in this country, although none has occurred in a University. Much of the ‘confined spaces’ work in the University is, of course, maintenance work performed by personnel from Estates & Facilities Management (either University employees themselves or
employees of outside contractors brought in to work for us). For some of this work, all the precautions described in this guidance are necessary. Estates & Facilities Management have extensive procedures to cover all reasonably foreseeable eventualities, the ramifications of which go beyond what can easily be covered in a general code of practice such as this.

However, some academic departments (e.g. engineers, geologists, archeologists) could decide to pursue research or teaching which falls within the ambit of the Regulations. This guidance will, therefore, describe in general terms what the Regulations require, and what all University departments have to do both to comply with the Regulations and to ensure safety. It is strongly recommended that any department contemplating work in confined spaces discuss their proposals with staff at Health & Safety Department, having first carried out a full risk assessment.

4. What is a Confined Space?

The term confined space means much more than simply ‘a tiny volume where you might get stuck’! There is a legal definition given in Regulation 1(2):- “Confined Space’ means any place, including any chamber, tank, vat, silo, pit, trench, pipe, sewer, flue, well or other similar space which by virtue of its enclosed nature, there arises a reasonably foreseeable specified risk”. The concept of a confined space in law is therefore twofold:-

- It is substantially, but not always entirely, enclosed, and there has to be a real possibility of serious injury;

- Moreover, this has to be as a result of exposure to a 'specified risk'. There is a definition of the term a 'specified risk' given in the Regulations too:-
  - any serious injury to a worker caused by fire or explosion;
  - loss of consciousness caused by lack of oxygen, a toxic or asphyxiating gas or vapour or 'free-flowing solid', or even by heat exhaustion;
  - drowning (caused by the rising level of a liquid (as opposed to falling into, say, a tank of water)).

Thus, in the Regulations the confined space has two defining features, enclosure to a substantial degree, and the significant possibility of being drowned, injured in a fire or explosion, or asphyxiated or poisoned, or any combination of these.

5. University Guidance on Work in Confined Spaces

Summary

The primary obligation under the Regulations is placed on the President & Vice Chancellor:

- Heads of Department must ensure that the requirements of the Regulations are complied with in their area of responsibility, and incorporate their policy, departmental organisation and arrangements into their 'local safety procedures';

- Members of staff who plan, organise, or lead research or maintenance which unavoidably entails entry into a confined space must ensure that a suitable risk assessment has been performed and an appropriate control strategy implemented;

- Any member of staff or student who enters a confined space must conform to the safety instructions issued to them.

The Confined Spaces Regulations 1997 place substantial duties on the University to prevent or safely control entry into, or work within, confined spaces. (For a fuller discussion of the requirements of the Regulations, see Appendix 1). In law a confined space is defined by both the confining nature of the space and the possibility of the atmosphere becoming unbreathable. Having identified where such situations could occur, it is vital to prevent unnecessary entry into
confined spaces: if the desired result can be achieved without entry, then this must be what happens. If entry is unavoidable, then risks to those entering must be rigorously guarded against by a combination of technical and managerial procedures, up to and including a full formal permit-to-work system. The strategy for the control of risks must be the result of a risk assessment.

The President & Vice Chancellor delegates the following duties to Heads of Department within whose area of responsibility confined space work is carried on (either within or beneath University premises or outwith the campuses) to:-

- ensure that such activities are planned and managed in compliance with the Confined Spaces Regulations 1997, and are carried on safely in practice;
- ensure that their policy and procedures on entry into and work within confined spaces form part of their 'local safety arrangements', and in particular to ensure that suitable and sufficient risk assessments are completed, a process which ought to entail a full description of the proposed control strategy for the work envisaged;
- provide the Director of Health & Safety, or local Health & Safety Manager when asked, with information about the nature and control of such activities, to allow that person to determine the degree of the University's compliance with the law, and;
- act promptly on any remedial action or improvements required by the University.

Checklist for Heads of Department:

- Have you identified all the work involving confined spaces which members of your unit could be engaged in?
- Are you satisfied that entry to confined spaces within the control of your Department/Research Institute/Professional Service Department is effectively precluded unless entry is unavoidable for the purposes of duly authorised research, teaching or maintenance?
- Have your staff provided you with suitable risk assessments for work involving confined spaces?
- Have you written an effective statement of your policy on work involving confined spaces as an adjunct to your 'local safety arrangements'?
- Are the control measures for the work appropriate, suitable and sufficient?
- Are those involved in the proposed work trained to a level appropriate to their responsibilities?
- Has an appropriate emergency plan been prepared for each entry into a confined space, and communicated to all those involved?

It is the responsibility of each member of staff who plans, organises or otherwise leads research, teaching or maintenance work which could involve entry into or work within confined spaces to:-

- Avoid such entry wherever this is reasonably practicable;
- Where entry into a confined space cannot be avoided, ensure that all the relevant requirements of the law are adhered to, as described in this guidance, and in their Departmental 'local safety arrangements'. This is likely to entail:
  - Preparing a risk assessment for the proposed work;
  - Ensuring that a suitable safe system of work has been devised;
  - Ensuring that those involved a suitably trained and supervised;
• Ensuring that there are appropriate emergency procedures in place.

• Comply with Departmental requirements on the technical and managerial monitoring of such activities, and;

• Provide such information as may be asked for by the University on the nature and safe management of such activities.

Checklist for academic and professional services personnel directly involved in planning leading or organising work in confined spaces:

• Do you effectively preclude unauthorised entry to confined spaces which are within your control?

• Are you familiar with the requirements of the Local Safety Arrangements as regards safe entry into, and work within, confined spaces?

• Have you completed suitable risk assessments for any work involving entry into confined spaces which are within your control?

• Have you received risk assessments from any third party who controls a confined space remote from the University campuses?

• Are you satisfied that the control measures outlined in these risk assessments accurately reflect the degree of risk likely to be encountered by those entering the confined space?

• Have the staff and/or students who will be entering the confined space received appropriate information and training. Have arrangements been made for the supervision of the inexperienced?

• Have you informed the relevant Head of Department of the results of the risk assessment?

It is the responsibility of each member of staff whose work requires them to enter into or work in a confined space to:

• Adhere rigorously to the requirements of any work permit issued to them, or any verbal instruction from a supervisory officer, about entry into or work within any confined space;

• Use any personal protective or work equipment issued to them in a proper manner (and report any defects in such equipment), and;

• Take all reasonable steps to ensure the health and safety of themselves and others when entering or working in a confined space.

It is the responsibility of any student whose studies require them to undertake entry into or work within a confined space to:

• Refrain from entering any confined space unless the work has been duly authorised by their Department, and;

• Rigorously and conscientiously follow any safety instruction issued to them by the academic staff member in charge of the class.

6. Risk Assessment for Work in Confined Spaces

Summary

• Risk assessment is a safety management technique to identify whether a particular set of precautions are adequate, or if more must be done to safeguard those taking part.

• The hazards of entry into a confined space include: oxygen deficiency; toxic gases; ingress of liquids and free-flowing solids; fire and explosion; and heat stress.
• Those at risk could include: staff and/or students.

• Control strategies include: preventing unauthorised entry; restricting the number of people at risk; training; permit to work systems; safe access and egress; testing the atmosphere before and/or during entry; communications; fire prevention; control of the environment by purging or forced ventilation; and the use of appropriate work equipment.

• Emergency procedures must be appropriate and effective.

• Records must be kept of the decisions making process.

• The Health & Safety Department are empowered to monitor and insist on compliance with the Regulations.

7. **Introduction to Risk Assessment**

Risk assessment is a careful examination of what could cause harm to people, and whether appropriate precautions have been taken, or whether more needs to be done. In principle, it is a simple process, which can be adapted to most occupational situations. Firstly, two definitions:

A hazard is an inherent property of a location, tool, substance or system of work which can cause harm (e.g. chemicals, electricity, working with ladders); the risk is the probability that someone will be harmed, and how badly.

A risk assessment is carried out as follows:-

1. Identify the significant hazards by using all the available information sources.

2. Decide who might be harmed, and how. For example staff and students, not forgetting anyone who might be at risk because they work at unusual times (e.g. cleaners) or who might be more at risk than average (e.g. someone with sensory or mobility impairment).

3. Decide whether existing precautions are adequate or if more should be done. Look at each significant hazard in turn, if it can be eliminated altogether, then do so, if not, then plan how the risks can be prioritised and minimised. Compare what you intend to do with what is usual in such circumstances.

4. Record what you have decided to do and why. This applies to each significant risk; it should show that the risk has in fact been assessed properly, and what has been, or will be done, to prevent harm. When this has been done, tell everyone who needs to know what the assessment record requires them to do to ensure safety.

5. If the work, or those involved, change substantially, review the assessment to make sure that it still makes sense to follow it.

The remainder of this section discusses the process of risk assessment as it might be applied to entry into, and work within, confined spaces. Any University employee who is contemplating work in confined spaces is strongly advised to study the process and compare the guidance contained herein with any risk assessment which has been written for their benefit by their Department.

**The Hazards of Confined Spaces**

The hazards of working in a confined space arise through a combination of the nature of the working space itself, and the possible presence of substances or conditions which, taken together, increase the risk to workers’ health and safety. Remember that a serious risk can be introduced to a substantially enclosed space that otherwise would be safe. The most likely hazards (but not the only ones) are the following:-
Oxygen deficiency

Below the usual level of about 20.9%, people become less able to function properly and eventually lose consciousness. Oxygen deficiency can be caused by biological or chemical processes consuming the oxygen in an enclosed chamber; as a result of purging with an inert gas to remove contaminants; or as a result of the work itself, e.g. welding; or even the respiration of workers if the fresh air is inadequate.

Toxic Gases, Fumes or Vapour

Toxic vapours of many types can accumulate in a confined space for a variety of reasons. These include:

- Vapours from disturbed deposits or sludge, remains from previous processing or storage, or residues from cleaning.
- Vapour produced by the work itself, e.g. welding fume, lead fume, brush or spray painting, solvents from cleaning etc.
- Vapour produced by work outside the confined space can also cause fumes to be given off inside, e.g. by welding on the outside.
- Vapour can seep in from surrounding areas while the work is in progress.

If the presence of contaminated air is known or suspected, stringent precautions must be taken to protect those inside or about to enter.

Ingress of Water, Other Liquids or Free-Flowing Solid Substances

Work in a tunnel or duct, or in large chemical or biotechnological plant could result in someone inside finding themselves in water (or another liquid) which is rising dangerously. A similar danger of drowning exists with free-flowing solids like grain, or finely divided chemicals in large storage facilities like a silo or storage bin. Inadvertent operation of machinery could result in a gas or steam being allowed to enter where people are at work.

Flammable Substances and Oxygen Enrichment

Biological or chemical processes can also cause the oxygen concentration in a confined space to rise. If this is coupled to the presence of flammable or explosive gases (or dust) and a source of ignition, then there is a real risk of a fire or explosion.

Excessive Heat

The presence of elevated (or rising) temperatures will exacerbate the exhausting effects of strenuous work, and increase the possibility of fire or explosion, or increase the generation of toxic fume or vapour.

8. Other Regulatory Requirements

The requirements of other Regulations should not be forgotten. They might highlight similar or allied hazards to those outlined above, or place parallel duties on those managing the work. Some of the relevant legal requirements include:

- The Control of Substances Hazardous to Health Regulations 2002
- The Electricity at Work Regulations 1989
- The Provision and Use of Work Equipment Regulations 1998
- The Control of Asbestos Regulations 2012
9. **Who Could be at Risk?**

Of Estates & Facilities Management staff, those at risk could include any tradesman or managers active in the field such as plumbers, electricians, heating and venting engineers, supervisors, estates development managers, clerk of works etc.

In an academic setting, it is possible that geologists, archeologists, engineers, geographers and biologists of many different disciplines, and their students (undergraduate or postgraduate) could be involved in this kind of activity. They may wish to enter a confined space to take samples or check on the progress of an experiment.

Clearly, the experience and initiative which can be attributed to such people varies tremendously: from the highly experienced professional scientist or tradesman to an inexperienced undergraduate. The relative experience or abilities of those entering a confined space must be taken into account when the venture is being planned. It is for this reason that the responsibilities of those in charge of the work have to be stipulated so precisely.

The personnel who are to enter a confined space need to be competent for the task at hand. If their job is simply to walk into a cave, stand and observe, then no specific skills are necessary, other than an instruction from the group leader (while outside) to follow orders when in the cave.

The specific training appropriate for more complex or risky tasks depends on the outcome of the risk assessment, but ought to include:

- What the Regulations say, in particular what their own legal obligations are and especially the need to avoid unnecessary entry to a confined space.
- The work to be done and the precautions appropriate in each case.
- The operation of the system of work to be followed, and in particular the operation of any permit-to-work system.
- How emergencies might arise, what arrangements are in force, and what their duties are in each case.

10. **Control Strategies for Ensuring Safety in Confined Spaces**

Regulation 4 says that if it is possible to carry out a job without recourse to entering a confined space, then this is the way it must be done: going into a confined space without a full consideration of, and protection against, the risks is not permissible. This Regulation goes on to say that if entry is necessary, then this must not be contemplated unless there is a system of work which “renders that work safe and without risks to health”.

The first question is therefore whether the desired outcome can be achieved without entry. For example:

- Can the confined space itself be modified so that entry is not necessary?
- Can the work be done from the outside? For example:
  - blockages might be cleared by ‘rodding’ or air purging;
  - inspection, sampling and cleaning might be done by machines operated externally;
remote cameras might be used for internal inspection.

It is only when such alternatives have been considered and rejected as not being 'reasonably practicable', that entry is permissible, under a 'safe system of work'.

Risk assessment is the management tool specified in the Regulations for identifying what has to be done to ensure safety - the 'safe system of work'. This section indicates what protective and preventive measures might need to be considered, depending on the nature of the hazards and people at risk.

Most confined spaces within University precincts will be controlled by the Director of Estates & Facilities Management. These include various tanks, ducts, tunnels and boilers. These confined spaces will be kept locked and casual attempts at entry are discouraged by 'no entry' signs. Confined spaces outwith the University's precincts - and therefore outwith its direct control - will often be where research or teaching is going on. These are usually under the control of either a third party (e.g. a farmer or landowner etc.), or perhaps a member of academic staff (e.g. an archeological dig or geological site etc.). There should be specific rules which regulate access to these sites. In any case, members of the general of public should not have easy access. A risk assessment, if necessary for a 'first-time' visit to such a site, and the general guidance in the University policies and guidance must be followed. Clearly, in any location which is outside the direct control of University personnel, effective communication between the University department concerned and the owner is vital.

For most situations, the risk assessment will demand that a selection of management and technical strategies be adopted. This constitutes the 'safe system of work'. Clearly the strategy for cleaning the interior of a car with a solvent cleaner will be straightforward compared to the precaution necessary when welding inside a storm drain. It is part of the function of the risk assessment to identify specifically which strategies are appropriate and necessary.

In summary, any control strategy for entry into or work within a confined space will amount to:-

- Restrict access to the confined space. If access is not justifiable, do the work remotely.
- Reduce the number of people exposed to the risks, and ensure that those who do enter are properly trained and/or supervised.
- Test and monitor for the presence of contaminants in the atmosphere.
- Have effective emergency procedures.

'Management' strategies for ensuring safety in confined spaces include:-

- again, it must be stressed that entry to a confined space must be prevented if the desired outcome can be achieved by another means; hence:
- the person in charge of the confined space must ensure that no-one who is not authorized can enter the confined space. Thus, entry by members of the general public (or, indeed, any unauthorised person) must be effectively prevented;
- restrict the number of people at risk;
- train those who have to enter a confined space. The training has to be consistent with the job in hand, the individual's role and responsibilities. For the novice, a high level of supervision will be necessary to allow them to build up experience and confidence safely;
- the Permit-to-Work system (see Appendix 2). Such a system is required:-
  o to tell people what significant risks they could encounter in the confined space;
  o to ensure that the elements of the safe system of work are in place;
o if there is a need to coordinate the activities of several workers and exclude potential problems posed by the presence or activities of others;

o if complex authorisations communications or procedures are required.

'Technical' strategies which are a necessary adjunct to the above, include:-

- Access: a safe means of entering and leaving a confined space must be provided to ensure that people can get in and out easily. Clear and conspicuous signs to BS 5378 and/or 5499 should be posted alongside openings while work is in progress;

- Fire Prevention: Fire prevention procedures are of even greater importance than usual when applied to work in a confined space. Keep flammable or potentially explosive materials stored in the confined space to an absolute minimum, and use in suitable containers; do not smoke; take care to eliminate the possibility of static electricity build up.

- Control of the Environment:
  - purging: a confined space which has been used for the storage of a volatile (say, a toxic, flammable or potentially explosive) substance may need to be purged with nitrogen or other inert gas;
  - ventilation: forced mechanical ventilation may well be necessary to ensure a plentiful supply of breathable air;
  - isolation: confined spaces may need to be physically isolated to prevent the ingress of substances which could pose a risk to those inside, or electrically and/or mechanically isolated to prevent someone outside the confined space inadvertently putting those inside at risk;

- Equipment: any equipment for use in a confined space must be suitable for the purpose. This will include:-
  - testing and monitoring the atmosphere: The nature of the work or the workplace may demand that before entry the atmosphere inside the confined space is tested for oxygen level, hydrogen sulphide, hydrocarbons etc. This will inform decisions about respiratory protective equipment (RPE) and ventilation;
  - electrical equipment may need to be certified as being safe for use in a flammable atmosphere, and earthed;
  - RPE and other personal protective equipment (PPE): The type of PPE will depend on the hazards identified, but could include safety lines, and harnesses, head and eye protection, and protective footwear. Designing and implementing an effective RPE programme is a considerable undertaking, and in such situations Health & Safety Department must be consulted;
  - piped gas supplies: at the end of any work period remove any such pipes and close all valves;
  - communication: if personnel could get into difficulties while out of sight of the main party, or if they must descend far into a confined space, or if the environment is noisy, then consider how they can continue to communicate easily with the outside, especially if they have to raise the alarm;
  - lighting: must be adequate for both the work and the workplace. Consider its physical robustness, and electrical integrity and protection. Position it so as to give illumination of the work and clearance for activity in both planned and emergency situations.
11. Emergency Procedures

When things go wrong, people may be exposed to serious and immediate danger. Regulation 5 stipulates that "no person shall enter or carry out work in a confined space unless there have been prepared ... suitable and sufficient arrangements for the rescue of persons in the event of an emergency ... ". Clearly these arrangements will depend on the nature of the confined space, the hazards identified and the risk assessment. All the possible aspects of confined space emergency procedure and planning cannot be examined in a brief guide such as this, but to be 'suitable and sufficient', the emergency plans and procedures need to focus on the following:-

- the type, quantity and location of any rescue and resuscitation equipment. The actual equipment clearly needs to be appropriate to the foreseeable needs as identified by the risk assessment;
- communications, and in particular the means of raising the alarm;
- training for all those who might be involved in a rescue :-
  - safe use of RPE, lifelines, harnesses etc.;
  - resuscitation and first aid;
  - fire fighting equipment;
  - atmospheric testing equipment;
- Liaison with the local emergency services and/or Security Control.

12. Record Keeping

Under both the Management of Health and Safety at Work Regulations and the Confined Spaces Regulations it is a requirement to record the results of a risk assessment. It is not necessary to record every aspect of every assessment, but only those aspects relating to a significant specified risk. It is therefore recommended that departments record risk assessments made under the Confined Spaces Regulations as an adjunct to similar assessments made under the Management Regulations or similar legislation (e.g. COSHH). The overall object is to assure ourselves that we are doing what we must do to comply with this aspect of the law.

The main features of a risk assessment record under the Regulations are:-

- the justification for entry into a confined space;
- the nature of the work;
- the significant risks which could be encountered;
- the appropriate control strategy:
  - permits-to-work;
  - the safe system of work;
  - PPE and RPE;
- the various duties of those involved:
  - the training and experience of those with 'safety critical' task;
- the emergency procedures.
13. Monitoring Compliance with the Confined Spaces Regulations 1997

Any management system, if left alone, will deteriorate over time. Where entry into confined spaces are concerned this could prove fatal. It is therefore a requirement that where such entry occurs, Heads of Department detail what they expect to happen in their local safety statement, and also periodically monitor that this statement remains relevant and effective.

For the University Health and Safety Committee to assure itself that it is doing what it must, staff of Health & Safety Department will, from time to time, require certain information from Heads of Department. This will include (inter alia): copies of statements of local policy taken from local safety statements; risk assessments relating to entry into and work within confined spaces; systems of work (including permits to work); records of these and other related activities.
Appendix 1 - The Confined Spaces Regulations 1997 - Commentary and Analysis

This Appendix describes the Confined Spaces Regulations 1997 (SI 197 No. 1713). Since some of the individual Regulations are for the purposes of legal formulation only, not all are discussed here. Their general features are described discursively, but some detail is included on those individual regulations which might have greatest impact on our work. The reader is referred to the Health and Safety Commission guidance on this topic which contains the Regulations themselves, and the cognate paragraphs of the Approved Code of Practice interspersed with HSE’s guidance. These are available bound together as document L101, which is available from HSE Books; its ISBN is 0 7176 1405 0. Words or phrases used in this Appendix in italics are direct quotes from booklet L101.

The Regulations are made under the Health and Safety at Work Act 1974 and have the same legal force as it. They came into effect on 28th January 1998. They apply to all work within the University itself and to work done on the University’s behalf in Great Britain (but not Northern Ireland, where similar but separate requirements apply). They also apply in a limited sense on certain off-shore structures. They do not apply below ground in mines or to diving operations where other Regulations apply instead.

**Regulation 1** contains the definitions used in the Regulations. It defines a confined space and the hazards of such work. It also describes a ‘free-flowing solid’ as any substance consisting of solid particles and which is of, or is capable of being in a flowing or running consistency, and includes flour, grain, sugar, sand or other similar material. The reader can perhaps add to this list in the context of the work of the University: agricultural slurry, cement or concrete, oil or sewage sludge; in fact any material which on close examination is a particulate solid, but which in bulk, and under some certain circumstances, could flow like a liquid.

**Regulation 3** places the primary duties for compliance with the Regulations on an employer or a self-employed person. In the case of the University, this would be the University UEB as the body corporate. The duty extends not only to ensuring compliance with each Regulation by its own employees but also ensuring that its contractors comply too.

**Regulation 4** begins the legal process of specifying these duties. This includes preventing entry to confined spaces in situations where the work can be done from the outside. If the work does, after due consideration of all the alternatives, require entry into a confined space, a safe system of work must be developed to ensure safety.

**Regulation 5** stipulates that no person may enter a confined space without suitable and sufficient arrangements for their rescue in the event of an emergency ... (and, where a need has been identified), resuscitation equipment (is) provided and maintained. The Approved Code of Practice explains in some detail what would be considered suitable and sufficient.

These three Regulations place onerous duties on the University, those individuals who control its activities, or who invite contractors to work here. Because of the diversity of work in confined spaces, both in location, degree of risk and the competence of those involved, the primary onus is on the employer - the person or organisation who directs or controls the work to ensure safety. As is usually the case in safety law nowadays, management must evaluate the degree of risk and the necessary control strategy is arrived at through the process of risk assessment. This is explicitly required in paragraphs 22-27 of the Approved Code of Practice.

In summary, a hierarchy of controls is developed and described in the Regulations and the explanatory guidance to minimise the likelihood of disaster by placing on us these rules:-

- Do not enter a confined space (as defined) unless there is no alternative;

- Do not enter a confined space unless a full assessment has been made of all the likely safety risks, and these can be controlled through the implementation of a safe system of work;
• Do not enter a confined space unless there are suitable and effective emergency procedures in place.

All of these are described in detail in the booklet L101, and again, it must be stated unequivocally, that any University personnel contemplating work in confined spaces are strongly advised to read it carefully, plan their work accordingly, and discuss what is proposed with Health & Safety Department well before the work begins.
Appendix 2 - Permit to Work Systems

A permit to work system is a formal written system used to control certain types of work which have been identified as being high risk. It is also a means of communication between those who direct work (broadly, management), those who have to work in confined spaces, and those who need to take particular notice of the work so that by their actions they do not endanger others.

The permit authorises certain named people to do certain things, at a certain time, and which sets out the main precautions needed to complete the work safely. Sometimes this is augmented by a detailed method statement.

The permit to work therefore reassures those about to enter, that the work will be kept safe, and tells those remaining outside what action they ought to take (and perhaps what action not to take!). To achieve this, the permit system has to be flexible (to take account of the possibly variable nature of the work) but remain a truly effective control. Any University department which considers a permit to work system appropriate for their work (for confined space entry or any other similar purpose) should contact Health & Safety Department for guidance on its design and implementation.

The design of a permit to work system can be complex, and rarely does the permit ‘stand alone’: it is usually accompanied by a local guidance document which explains the way in which the system is meant to operate. This check-list will help those designing or preparing a permit-to-work system to decide whether they have covered all the essential points. If the answer to any point is ‘no’, then you should ask whether the absence of this feature in the system will compromise anyone’s safety in a confined space.

1. Does the permit cover all the relevant legal requirements?
2. Does the permit clearly define the limits of the work and the location concerned?
3. Does the permit procedure extend to contractors and their employees?
4. Is compliance with the permit procedure understood by all involved as being essential for certain types of work?
5. Is it clearly laid down who has the authority to issue permits?
6. Have personnel who issue permits been formally authorised and received suitable training?
7. Do permits clearly specify to whom they are issued?
8. Does the recipient have to sign the permit to show that he has both read the permit and understood the conditions laid down in it?
9. Does the procedure provide both for the recipient to retain the permit, and for a record of live permits to be maintained at the point of issue?
10. Does the system stipulate where ‘live’ permits must be displayed?
11. Do permits specify clearly a time limit for expiry or renewal?
12. Do permits specify clearly the plant or geographical location to which the work must be limited?
13. Does the system ensure that the person in charge of the work site is aware of all work controlled by permits which is proceeding within his area of responsibility?
• Does the permit procedure include a hand-over mechanism for work which extends beyond a shift or work period?
• Is a hand-back signature required when the activity is complete?
• Does the system show how the effectiveness of the procedures will be monitored?
• How will the effectiveness of the system be reviewed?

It is important that one activity authorised under a permit to work system does not create danger for another. Those who authorise the issue of permits should be aware of potential interactions, and should ensure that when a permit is issued it takes account of, and does not conflict with permits already issued and still valid.