Department for Communities & Local Government

CFRA
CHIEF FIRE & RESCUE ADVISER

Fire and Rescue Authorities Operational Guidance

GRAs
generic risk assessments

GRA 2.1
Rescues from confined spaces

Generic Risk Assessment 2.1

Rescues from confined spaces

April 2013

London: TSO

TSO
information & publishing solutions

Published by TSO (The Stationery Office) and available from:

Online
www.tsoshop.co.uk

Mail, Telephone, Fax & E-mail
TSO
PO Box 29, Norwich, NR3 1GN
Telephone orders/General enquiries: 0870 600 5522
Fax orders: 0870 600 5533
E-mail: customer.services@tso.co.uk
Textphone: 0870 240 3701

TSO@Blackwell and other Accredited Agents

Published with the permission of the Department for Communities and Local Government on behalf of Her Majesty's Stationery office.

ISBN 9780117541160

Any enquiries regarding this publication should be sent to us at
Dept for Communities & Local Government
Eland House
Bressenden Place
London
SW1E 5DU.

Printed in the United Kingdom by The Stationery Office

J002684469 C2 04/13 25197 19585

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SECTION 1

Generic Risk Assessment 2.1 Rescues from confined spaces

Scope

This generic risk assessment examines the hazards, risks and control measures relating to fire and rescue personnel, the personnel of other agencies and members of the public.

This document aims to offer Fire and Rescue Authorities guidance on how to identify confined spaces, and the appropriate action to take at incidents to protect personnel who are mobilised to such incidents.

Depending on the nature and scale of the operational incident a variety of significant hazards may be present. Fire and Rescue Authorities may therefore need to consider the contents of other specific generic risk assessments in this series.

This may include:

- 2.1 Rescues from confined space
- 2.1.1 Rescues from sewers
- 2.1 2 Rescues from silos
- 2.1.4 Rescues from collapsed structures
- 5.10 Working at heights

Details of documents that contain technical and supporting information can be found in the Technical reference section of this generic risk assessment.

Fire and Rescue Authorities must conduct their own assessments and produce their own safe systems of work (which include standard operating procedures, training programmes, provision of equipment, levels of response etc) within the context of integrated risk management plans, local conditions, knowledge and existing organisational arrangements.

This generic risk assessment will be reviewed for its currency and accuracy three years from date of publication. The Operational Guidance Strategy Board will be responsible for commissioning the review and any decision for revision or amendment.

The Operational Guidance Strategy Board may decide that a full or partial review is required within this period.

Significant hazards and risks

Definitions

The *Confined Space Regulations 1997* define a confined space as:-

> *"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' is further defined as a risk of the:

- serious injury to any person at work arising from a fire or explosion
- loss of consciousness of any person at work arising from an increase in body temperature
- loss of consciousness or asphyxiation of any person at work, arising from gas, fume, vapour or lack of oxygen
- drowning of any person at work arising from an increase in the level of liquid
- asphyxiation of any person at work arising from a free flowing solid, or the inability to reach a respirable environment due to the entrapment by a free flowing solid.

Under the Regulations, a confined space has two defining features:

(a) It is a space which is substantially (but not always entirely) enclosed.

(b) There is a reasonably foreseeable risk of serious injury to personnel from hazardous substances or conditions in the space.

Hazards

The hazards in a confined space arise by the combination of the confined nature of the work place and the possible presence of substances or conditions which could increase the risk to the health and safety of personnel. Fire and Rescue Authorities must consider the possibility that a hazard could be introduced to a confined space during an incident, eg water.

Inappropriate and/or insufficient resources to provide safe systems of work for the Fire and Rescue Authority task

There is a societal expectation that a firefighting team will arrive and achieve something. Evidence from accident investigations has shown that firefighters will attempt tasks regardless of the resources available to them risking death or serious injury.

Toxic gas; fume, vapour, or CO2

- fume may remain in a confined space from previous usage, or arise from the disturbance of sludge or deposits contained within it
- hydrocarbon vapour may be present under scale or rust, even after cleaning
- fume may enter a confined space from adjoining plant that has not been thoroughly isolated
- gas and fume may leak from behind coatings or linings
- gas and fume may build up in sewers; manholes; access shafts; or contaminated ground
- fume and vapour can be produced by work inside the confined space such as during flame cutting or welding
- a build up of CO_2 can accumulate through personnel working in a confined space
- lining processes
- spraying and painting
- the use of glass reinforced plastics; adhesives and solvents.

Gas fume and vapour can occur inside a confined space as a result of activities taking place outside the confined space. For example, hot work to the exterior and exhaust gases entering from vehicles or plant adjacent to the confined space.

Failure of plant may lead to the accumulation of gasses, in particular ammonia from the failure of refrigeration plant or carbon dioxide in cellars due to leaking carbon dioxide cylinders.

Oxygen deficiency

Oxygen deficient atmospheres may result from:

- Purging of the confined space with an inert gas to remove flammable gas; fume; vapour or aerosols
- Naturally occurring biological processes which consume oxygen (aerobic) such as sewers; storage tanks; storm drains and wells etc
- Ships holds and land based storage vessels or feed hoppers which contain wood fuel pellets can degrade and displace the oxygen in the compartment
- Gases can be produced as a result of fermentation in sealed silos where crops have been or are being stored; fermentation vessels in brewing processes, cargo holds carrying timber products; steel swarf, vegetable products; grain coal etc displacing the oxygen
- The action of rusting takes oxygen from the surrounding atmosphere. Leaving a steel vessel completely closed for some time can lead to an oxygen deficient atmosphere. Newly fabricated carbon (mild) steel vessels which have been shot blasted are particularly vulnerable to rusting

- Carbon dioxide levels may increase when limestone chippings used in drainage in the base of trenches get wet through rain water (water reacts chemically with limestone to produce CO_2
- Flame cutting (burning), welding and grinding which consume oxygen
- Air displacement when using liquid nitrogen to freeze pipes
- The gradual depletion of oxygen as personnel breathe where the replenishment of air is inadequate.

Flammable substances and oxygen enrichment

A risk of fire and explosion can arise from the presence of a flammable substance; an excess of oxygen in the atmosphere; or the ignition of airborne substances. It can also be caused by leaks from adjoining plant that has not been effectively isolated.

Liquids

Liquids can flow into the confined space and drown personnel, or lead to other serious injuries dependant on the nature; toxicity; or corrosiveness of the liquid. Liquids can also hinder access/egress and cover other hazards contained within the confined space. Prolonged submersion in cold liquids can create hypothermic symptoms for persons within the confined space.

Solid materials which can flow

Free flowing solids are substances consisting of solid particles that are capable of being in a flowing or running consistency. Examples include flour; sand; grain; coal dust.

Free flowing solids can flow into the confined space and submerge a person, causing asphyxiation.

Contamination and biological / chemical hazards

Biological hazards, in particular waterborne diseases, must be expected to be present at these types of incidents and there are a number of infections that can be encountered, including:

- Salmonella
- Amoebic dysentery
- Tetanus
- Typhoid
- Polio
- Hepatitis
- Weil's disease (leptospirosis).

Zoonoses (ie conditions that are shared and mutually transmissible between humans and animals) pose significant health risks to personnel from direct or indirect contact with live or dead animals.

Acute/chronic illness from exposure to water contaminants, eg oil, solvent, chemicals.

Further guidance can be sourced in Generic Risk Assessments 5.4 and 5.3 – Biological and Chemical hazards.

Extremes of temperature

HYPOTHERMIA AND HYPERTHERMIA

Hypothermia is a physical condition that occurs when the body's core temperature falls below a normal 98.6° F (37° C) to 95° F (35° C) or cooler. Cold water dangerously accelerates the onset and progression of hypothermia since body heat can be lost 25 times faster in cold water than in cold air. Hypothermia affects the body's core – the brain, heart, lungs, and other vital organs. Even a mild case of hypothermia diminishes a victim's physical and mental abilities and can lead to a loss of dexterity and the ability to carry out simple tasks, thus increasing the risk of accidents. Severe hypothermia may result in unconsciousness and possibly death.

Hyperthermia is an elevated body temperature due to failed thermoregulation and is defined as a temperature greater than 37.5–38.3° C (100–101° F). Hyperthermia occurs when the body produces or absorbs more heat than it can dissipate.

Heat stroke is an acute condition of hyperthermia that is caused by prolonged exposure to excessive heat and/or humidity. The heat-regulating mechanisms of the body eventually become overwhelmed and unable to effectively deal with the heat, causing the body temperature to climb uncontrollably.

Working at height

When gaining access personnel risk falling into the confined space, equipment may fall onto personnel or a casualty while they are in the confined space causing serious or fatal injuries.

Further information on safe working at heights is contained in Generic Risk Assessment 5.10.

Manual handling

Many injuries are sustained on the incident ground due to the unsuitability of, or incorrect handling of equipment, or casualties. The additional aspect of working in restrictive personal protective equipment can also be an inhibiting factor.

Musculoskeletal injuries

Body positioning, force of movement and pace of work can all impact on personnel working within a confined space environment. These issues may also be compounded by the range of operating temperatures personnel may be required to work in, as a cold

environment will make the body less flexible and more susceptible to strains and other injury. Difficulty in adopting the correct body posture and the additional loads incurred by working within a confined space environment must also be considered.

Casualty/victim handling

A variety of risks can be associated with the incorrect handling of a casualty/victim. From the physical aspects of removing a casualty from a hazardous environment to the hazards presented by the casualty themselves. Conscious victims may exhibit panic, with counterproductive random movement such as thrashing and shouting or alternatively exhibit counter panic whereby the victim withdraws or offers little or no assistance.

Other non-specific hazards

Some other hazards may be present which are not specific to confined spaces but must be considered prior to committing crews into the confined space:

- electrical hazards which may lead to electrocution
- mechanical hazards, such as stirrers and augers
- service supplies
- potential to collapse – eg trench collapse or void exploration
- limited access and egress.

Key control measures

Planning

Planning is key to enhancing the safety of firefighters and others likely to be affected by Fire and Rescue Authority operations. Each Fire and Rescue Authority's strategic plans will set standards and identify the resources required to ensure safe systems of work are maintained.

Each Fire and Rescue Authority must assess the hazards and risks in their area relating to this generic risk assessment. The assessment must include other Fire and Rescue Authorities areas where 'cross border' arrangements make this appropriate.

Site-specific plans must be considered for locations where the hazards and risks are significant and plans must take into account hazards outside of the scope of Fire and Rescue Authority standard operating procedures, appliances and equipment. In particular, recognition must be given to the physical and psychological pressures that an operational incident may apply to fire and rescue personnel.

Site-specific plans must include:

- levels of response
- relevant standard operating procedures
- tactical considerations, including rendezvous points, appliance marshalling areas and access points
- identification and where necessary, the formal notification to person(s) responsible for the site of any Fire and Rescue Authority operational limitations.

Planning is underpinned by information gathering, much of which will be gained through inspections or visits by fire and rescue personnel – for example, those covered by section 7(2)d and 9(3)d of the *Fire and Rescue Services Act 2004*.

Information must also be gathered and used to review safe systems of work from sources both within and outside the Fire and Rescue Authority, including:

- fire safety audits
- incident de-briefs
- health and safety events
- local authorities
- local resilience fora.

Involving others in planning is an effective way to build good working relations with partner agencies and other interested parties, such as site owners.

Fire and Rescue Authorities must ensure systems are in place to record and regularly review risk information and to ensure that new risks are identified and recorded as soon as practicable.

Fire and Rescue Authorities must ensure that the information gathered is treated as confidential, unless disclosure is made in the course of duty or is required for legal reasons.

Fire and Rescue Authorities must consider the benefits of using consistent systems and formats to record information from all sources. Consideration must also be given to how timely access will be provided to inform and support operational decision-making.

Information needs will vary in proportion to the size and nature of the incident. The capacity of fire and rescue personnel to assimilate information will vary in relation to the complexity of the incident. Therefore, arrangements may need to be flexible and be based on more than one system.

Further guidance on planning can be found in *Fire and Rescue Service Operational Guidance, Operational Risk Information*, www.gov.uk/government/publications

Specific planning for this generic risk assessment must include:

- liaison with local industry to trigger alerts when work is being carried out in confined spaces
- combined training and exercises with industry to ensure each party is aware of each other's capabilities or limitations
- liaison and awareness with any on site specialist teams and the equipment and procedures available to them.

Competence and training

When formulating a competence and training strategy, Fire and Rescue Authorities must consider the following points:

- Ensure specific risk assessments for this incident type are suitable and sufficient, and those tasked with carrying out the assessment and developing procedures are competent to do so
- Fire and Rescue Authorities must ensure that their personnel are adequately trained to deal with the hazards and risks associated with this generic risk assessment
- The level and nature of training undertaken must be shaped by an informed training needs analysis that takes account of Fire and Rescue Authority guidance on the competency framework, national occupational standards and any individual training needs.

Training and development programmes must:

- Follow the principles set out in national guidance documents
- Generally be structured so that they move from simple to more complex tasks and from lower to higher levels of risk. Typically cover standard operational procedures as well as ensuring knowledge and understanding of equipment and the associated skills that will be required to use it

- Consider the need for appropriate levels of assessment and provide for continuous professional development, to ensure maintenance of skills and to update personnel whenever there are changes to procedure, equipment, etc
- Involve personnel involved in other processes that support the emergency response, such as planners devising procedures and people procuring equipment.

Specific training requirements for working in confined spaces will include the standard operating procedure and the equipment to be used.

Training outcomes must be evaluated to ensure that the training provided is effective, current and it meets defined operational needs as determined by the Fire and Rescue Authority's integrated risk management plan.

Site-specific tactical exercises must be undertaken with other agencies or personnel likely to assist at an actual incident.

Command and control

The Incident Commander must follow the principles of the current national incident command system. Prior to committing personnel into any hazard area, the Incident Commander must take account of the actual information about the incident that is available to make operational decisions in what are recognised as sometimes dangerous, fast moving and emotionally charged environments.

A thorough safety brief prior to deployment of personnel within the hazard zone must be carried out.

Operational discretion

Fire and Rescue Authorities operational procedure for confined spaces incidents must be robust but, recognise that it is impossible to anticipate every situation which may occur the procedure must allow the incident commander sufficient flexibility to exercise operational discretion when either planning arrangements or the prevailing circumstances make this justified.

It is anticipated that at the vast majority of confined spaces incidents, the full implementation of the Fire and Rescue Authority's operational procedure, without any deviation, will be necessary and wholly appropriate.

However, scenarios can arise at confined spaces incidents where a more rapid intervention is necessary, including occasions when it is necessary or desirable to:

- Rescue a 'saveable' life in circumstances where the complete implementation of confined spaces procedure would lead to an unjustifiable delay, resulting in the potential for greater injury or additional lives to be lost; or
- Tackle a known small fire through a pre-emptive strike to mitigate the risk that complete adherence to the confined spaces procedure might lead to delay. That has the potential to create higher levels of risk for firefighters who would then have to tackle a fully developed fire.

Any deviation from procedure must be justifiable in terms of risk versus benefit and based upon the Incident Commander knowing the actions which are normally required as part of operational procedure.

The level of justification required from the Incident Commander must also be proportional to the degree of deviation undertaken, ie significant deviation from an established procedure will require correspondingly high levels of justification.

The Incident Commander must return to standard operating procedures as soon as practicable.

Safety Officer(s)

The early appointment of one or more Safety Officer(s) will help ensure that risks are either eliminated or reduced to an acceptable level.

A safety decision-making model must be used to brief Safety Officers regarding the nature of the incident, the allocated task and prevailing hazards and risks. The Incident Commander must confirm that the Safety Officer understands:

- their role and area of responsibility
- allocated tasks
- lines of communication.

Those undertaking the Safety Officer role must:

- be competent to perform the role
- ensure the agreement of a recognised evacuation signal
- ensure personnel are wearing appropriate personal protective equipment
- monitor the physical condition of personnel and/or general or specific safety conditions at the incident, in accordance with their brief
- take any urgent corrective action required to ensure safety of personnel.
- update the Incident Commander or Incident Safety Sector Commander regarding any change in circumstances
- not be engaged in any other aspect of operations, unless this is required to deal with a risk critical situation.

The role of a Safety Officer can be carried out by any of the fire service roles, but the complexity of the task, size of the incident and scope of responsibility must be considered by the Incident Commander when determining the supervisory level required.

Safety Officers must wear nationally recognised identification to indicate they are undertaking the Safety Officer role.

Fire and Rescue Authorities must ensure that training and other measures (such as aide-memoires) are in place and available to support those personnel liable to undertake this role.

Flammable substances; oxygen enrichment; toxic gas; fume; vapour, and oxygen deficiency

Whenever practical, personnel must not be committed to the risk area until the risk of fire and explosion has been eliminated.

MONITORING

Whenever practical, the atmosphere must be monitored prior to entry into a confined space.

Oxygen testing and monitoring must be carried out prior to testing for flammable gases; followed by any further tests for toxic gases, vapours and dusts. All testing equipment must be appropriate to the risk, suitable for the task and calibrated according to manufacturer's recommendations. Fire and Rescues Authorities must consider the use of personal monitoring equipment.

All monitoring or testing must be carried by persons who are not only competent in the practice of measuring and monitoring but aware of the existing standards for the relevant airborne contaminants being measured but are also instructed and trained in the risks involved. Persons involved in carrying out the testing must also be capable of interpreting the results and informing the Incident Commander who will determine the course of action. A record of the monitoring results must be maintained and available at all times.

Monitoring and re-testing of the atmosphere within a confined space must be carried out throughout the duration of the incident and every time crews enter the confined space.

Breathing apparatus must be worn in any flammable or oxygen deficient environments.

Respirators must not be worn in oxygen deficient atmosphere.

GAS PURGING

Gas purging must be considered by the Incident Commander if monitoring or testing has identified the presence of flammable or toxic gases or vapours. If flammable gases are present this must be done with an inert gas such as nitrogen. Purging with air can produce a flammable or explosive mixture. The confined space must be tested once purging is complete to ensure the atmosphere is safe.

VENTILATION

Ventilation must be considered where the nature of the confined space dictates that fresh air is required to replenish the oxygen being consumed by the crews. Forced ventilation is preferable to exhaust ventilation which can have only a localised effect.

Ingress or presence of liquids and free flowing solids

- If liquids are present they must be assessed as to their toxicity and or corrosiveness and removed. Flammable liquids must be removed including any residues or the atmosphere rendered inert by purging with an inert gas such as nitrogen

- Consideration must be given to the possibility of the contamination of crews and fire kit within the confined space
- The confined space must be isolated from any chance of ingress of liquids by the isolation of pumps, feed lines and pipe work. Consider isolating the confined space entirely by the removal of sections of feed pipe work, or by the use of blanking flanges
- If valves cannot be isolated or locked in the closed position leave with a member of the crew or responsible person to ensure they cannot be opened
- If working in a confined space which contains free flowing solids, adequate steps must be taken to ensure that the surface will support the weight of the crews, by using crawl boards, inflatable structures such as air planks and mats, or consider working on work positioning systems which are capable of supporting the entire weight of the casualty and rescuer
- If excavation work is to be undertaken in the confined space to release a casualty from a free flowing solid, then consider appointing a dedicated safety officer to monitor any signs of collapse of the product or uneven loading of the confined space walls. Consider the use of atmospheric monitoring; ventilation, and the use of breathing apparatus.

Contamination and biological/chemical hazards

Arrangements must be in place for effective health surveillance of all personnel that are suspected of being exposed to any biohazards during an incident. This may be by means of an on-site specialist or Health Protection Agency whilst the incident is still in progress. Certain circumstances may require prophylaxis to be given for potential exposures.

> **NOTE:**
> In cases of suspected exposure to HIV or hepatitis virus there may be a need to provide post exposure prophylaxis within one hour.

Plans must be in place to provide monitoring and recording of biohazard exposure. *Control of Substances Hazardous to Health Regulations* requires that employers keep a list of all personnel exposed to hazard group 3 and 4 agents for at least 10 years (for those agents with delayed effects this list must be kept for 40 years).

Generic Risk Assessment 5.4 – Incidents involving biological hazards

Arrangements must be made on-site to enable the cleaning/decontamination of boots, gloves and fire-kit. If items cannot be sufficiently cleaned at the incident additional/specialist cleaning must be established in accordance with the Fire and Rescue Authority's decontamination procedures.

Extremes temperatures

Working conditions for this type of rescue may be difficult and the nature of the tasks arduous, therefore the Incident Commander must make suitable arrangements for rotation or resting of crews and the early provision of relief crews.

Musculoskeletal injuries

CASUALTY/VICTIM HANDLING AND MANUAL HANDLING

Consider ventilating the confined space and the use of breathing apparatus for casualties to protect airway.

When removing a casualty from the confined space, manual handling must be planned and coordinated. Mechanical means and additional personnel must be considered. Where space is restrictive, individuals must make every effort to adopt good manual handling techniques

Working at heights

Only essential resources must be deployed at height and provision of appropriate work positioning/fall arrest equipment provided. Fall zones for debris and/or equipment falling from height must be implemented, as must the requirement for all personnel to don the relevant personal protective equipment for the environment. Such personal protective equipment must include the provision of adequate head protection.

Personal protective equipment

Fire and Rescue Authorities must ensure that any personal protective equipment provided is fit for purpose and meets all required safety standards. When choosing suitable protective garments, the standard of clothing worn beneath the specialist personal protective equipment must also be taken into account. Consideration must also be given to the selection of suitable sizes and gender specific requirements.

Personal protective equipment must also take account of the need for rescuers to be visible against the operational background including night working and for the Incident Commander and other managerial and functional roles (defined in the national incident command system) to be distinguishable.

All personnel must use appropriate levels of service provided personal protective equipment and respiratory protective equipment as determined by the safe system of work.

Consider personal protective equipment to access and carry our work in the confined space, including casualty and personnel retrieval systems.

Do not use respirators in oxygen deficient environments.

Confined spaces that contain substances that would require the wearing of chemical protection suits need particular care. If the confined space also requires specialist access equipment such as harnesses, there can be potential for the two types of personal protective equipment to conflict. This will form a crucial part of the Incident Commander's risk assessment.

Post incident

The following measures must be considered to help eliminate or remove risks after an incident, as appropriate to the nature and scale of the incident.

- Any safety events; personal injuries, exposure to hazardous substances or near-misses must be recorded, investigated and reported in line with legislative requirements such as *Reporting of Injuries Diseases and Dangerous Occurrence Regulations 1995*, etc
- Arrangements must be in place to either remove all contamination from personal protective equipment or to ensure its safe and appropriate disposal and to check that personal protective equipment maintains the agreed levels of integrity and protection for the wearer throughout it's lifecycle
- As appropriate, occupational health support and surveillance follow up
- Conduct a de-brief to identify and record any 'lessons learned' from the incident. De-briefs will range in complexity and formality, proportionate to the scale of the incident and in line with individual Fire and Rescue Authority's procedures
- Consider any changes required to safe systems of work, appliances or equipment in the light of any lessons learned from debriefs or from safety events
- Consider the need to review existing information held on a premises or location, or the need to add a new premises or location into future preplanning eg by adding to visit or inspection programme
- Personnel must be supported and monitored to identify whether they are experiencing any adverse affects and to check whether they would benefit from accessing counselling and support services
- Consideration must be given to arranging for personnel to make a contemporaneous written record of their actions. This information may be used to assist in any internal or external investigations or enquiries that follow any incident eg Coroner's Court, public enquiry, etc.

Operational considerations

- Where practicable avoid entry into a confined space
- A robust command and control procedure must be established for personnel entering the confined space. Utilise breathing apparatus boards and personal tallies. Consider the use of guide line and branch line tallies to identify multiple teams

- Contractors/workers equipment could already be in place, eg a tripod, and this could influence the operational plan, ie do crews use equipment already in place? **NOTE:** As far as practicable Fire and Rescue Authority equipment must be used by responding crews as it's history of as maintenance and testing records will be known
- Consider making a confined space, not a confined space eg creating openings, removal of wall/roof, etc
- Ensure potential sources of fumes from generators/vehicles that could enter any confined space are keep clear of openings
- If ventilating a confined space, check where ventilated gases are exiting
- Consider the use of specialist rescue teams including urban search and rescue, hazardous area response team, mines rescue and mountain rescue teams
- Keep crew sizes to a minimum
- Consider reducing exposure time for crews in the confined space
- Reliefs may have to be on a one team out one team in approach dependant on access, egress and working conditions
- Any equipment taken into or used in a confined space must be appropriate to the risk, suitable for the task, and not introduce further risks
- Potential sources of ignition may include metallic items on personal protective eqipment and operational equipment
- Consider the compatibility of personal protective equipment, for example, using chemical protection suits with safety harnesses
- Electrical equipment ie portable lighting and torches must be suitable for the environment (ingress protection rating), and or ATEX dependant on intended use.

NOTE:
ATEX derives its name from the French title of the 94/9/EC directive: *Appareils destinés à être utilisés en ATmosphères EXplosives*.There are two ATEX directives (one for the manufacturer and one for the user of the equipment):

- the ATEX 95 equipment directive 94/9/EC, Equipment and protective systems intended for use in potentially explosive atmospheres
- the ATEX 137 workplace directive 99/92/EC, Minimum requirements for improving the safety and health protection of workers potentially at risk from explosive atmospheres.

Technical references	
1	Confined Spaces Regulations 1997
2	Work at height Regulations 2005 (as amended)
3	Provision and use of Work Equipment Regulations 1998
4	Personal Protective Equipment Regulations 1992
5	Lifting and Lowering Operations and Lifting Equipment Regulations 1998
6	Fire and Rescue Service Manual volume 2 Fire Service operations Safe Work at Height

SECTION 2

Summary of Generic Risk Assessment 2.1

Rescues from confined spaces

Task – Pre incident

Ref. No.	Activity	Hazard	Risk	Persons at risk	Control measures
1	Training for confined space entry procedures	Training in realistic conditions	Entrapment Muscular skeletal injuries Heat stress/ syncope Asphyxiation	Fire and rescue personnel	All Fire and Rescue Authority training to be carried out in accordance with *Fire and Rescue Service Manual, Volume 4, Fire Service Training; Foundation Training and Development* Consider mechanical lifting systems for casualty rescue Only drill mannequins to be used as casualties Monitor confined space training atmosphere before training and during training period.

Ref. No.	Activity	Hazard	Risk	Persons at risk	Control measures
1.1	Confined space entry	Inadequate preparedness for operational incident	Major injury Death	Fire and rescue personnel	Fire and Rescue Authority to gather information; liaise with industry; and record appropriate information Fire and Rescue Authority to ensure crews and Incident Commanders are adequately trained and competent Fire and Rescue Authority to ensure crews undertake regular training and exercises for confined space risks Fire and Rescue Authority to ensure suitable standard operating procedures are in place; current, and regularly reviewed Fire and Rescue Authority to identify, risk assess, plan and adequately control all reasonably foreseeable types of operational incident when working on confined spaces.

Task – Pre incident

Ref. No.	Activity	Hazard	Risk	Persons at risk	Control measures
2.	Access to the confined space entry or access point	Fall of a person from height Falling equipment	Serious injury or fatality	Fire and rescue personnel Public Other agencies	Incident Commander to consider using safe systems of work including; work restraint; work positioning or fall arrest methods Consider a robust command and control system Restrict entry to the inner cordon Lanyards for equipment Designated fall zones.
2.1	Atmospheric monitoring of the confined space prior to entry	Exposure to irrespirable atmospheres, flammable; toxic; and corrosive environments	Fire and explosion, chemical contamination and burns Asphyxiation Fatality	Fire and rescue personnel Public Other agencies	Use suitable calibrated monitoring equipment by competent person. Consider requesting Fire and Rescue Authority hazardous material and environmental protection officer Consider forced ventilation or purging Always utilise breathing apparatus until monitoring indicates low risk atmosphere Establish appropriate covering jet.
2.3	Isolation of electrical and mechanical hazards	Exposure to entrapment and entanglement	Electrocution Serious musculoskeletal injuries Fatality	Fire and rescue personnel Other agencies	Lock off electrical equipment Consider posting a member of the crew with the controls to ensure they cannot be activated.

Task – As the incident develops

Ref. No.	Activity	Hazard	Risk	Persons at risk	Control measures
3	Atmospheric monitoring of the confined space during the incident	Exposure to irrespirable atmospheres, flammable; toxic; and corrosive environments	Fire and explosion Chemical contamination and burns Asphyxiation	Fire and rescue personnel Public Other agencies	Use suitable calibrated monitoring equipment by competent person Consider requesting Fire and Rescue Authority hazardous material and environmental protection officer Establish appropriate covering jet Utilise an appropriate level of personal protective equipment.
3.1	Casualty rescues	Lifting and lowering casualties	Musculoskeletal injuries	Fire and rescue personnel	Consider mechanical lifting systems for casualty rescue Consider requesting specialist teams where available; ie the Ambulance Service Hazardous Area Response Team.
3.2	Crew welfare	Exposure of crews to extreme working environments	Exhaustion; heat stress, heat syncope	Fire and rescue personnel Other agencies	Reduce crew exposure time, consider relief crews Make hydration available to crews when withdrawn from the incident.
3.3	Confined space entry (same activity as 1.1)	Exposure to hazardous substances	Infection contamination or poisoning	Fire and rescue personnel	Incident Commander to deploy safety officers Record any exposure to hazardous materials De-contamination procedures must be followed where contamination has occurred.

Task – Post incident

Ref. No.	Activity	Hazard	Risk	Persons at risk	Control measures
4	Post incident de-brief	Exposure to extreme working environments	Post-traumatic stress disorder	Fire and rescue personnel Public Other agencies	Fire and Rescue Authority to make counselling services available.