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Fire and Rescue Service Operational Guidance

GRAs

generic risk assessments

GRA 2.6

Rescue of
trapped persons

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Generic Risk Assessment 2.6

Rescue of trapped persons

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SECTION 1

Generic risk assessment 2.6

Rescue of trapped persons

Scope

This generic risk assessment examines the hazards, risks and controls that relate to incidents where persons are trapped and require release.

This, as all generic risk assessments, provides a starting point for Fire and Rescue Services to conduct their own assessments within the context of local conditions and existing organisational arrangements.

This generic risk assessment is primarily concerned with the following types of entrapments:

Persons trapped in machinery

This category includes incidents where persons are physically trapped in, or by, industrial machinery. This may be in either locations within enclosed premises or in the open, such as in machinery typically associated with the farming industry, (e.g. combine harvesters, baling machines etc.).

Minor entrapments

This category includes incidents where persons are trapped by means other than machinery. It includes incidents in the home, where persons are trapped in baths, or where limbs or fingers/toes are trapped, (e.g. in plugholes or taps). It will also include incidents outside the home of a minor nature, (e.g. people with heads 'stuck' between railings etc).

Removal of articles

This classification includes removal of rings, handcuffs etc. or other articles temporarily affixed to the body.

It also includes the removal of other articles, on medical advice, whether on the incident ground, or in hospital operating theatres etc. As a sterile environment, there will be restrictions on items that can be taken into an operating theatre. This will include equipment to release the casualty, or even the personal protective equipment worn by fire and rescue service personnel.

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Significant hazards and risks

The hazards present at incidents where persons are trapped will vary and are dependant upon the circumstances of each individual case. Hazards may involve one, or more, of the following:

Machine hazards

Consideration should be given to the hazards created by the presence of different types of machinery. Hazards will vary dependant upon type, method of operation, and processes involved. In general, hazards may be either:

Mechanical hazards which include:

- entanglement
- friction and abrasion
- cutting or shearing
- stabbing or puncture
- impact
- crush
- drawing-in.

Non-mechanical hazards which include:

- chemical
- electrical
- noise and vibration
- pressure/vacuum
- inhalation of mist or vapour
- ionising radiation
- biological or bacterial
- temperature extreme
- lasers.

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Power supplies

Consideration should be given to the hazards associated with the various types of power supply in use, especially where isolation is required. Power supplies in common use include:

- electricity
- pneumatic
- hydraulic
- stored energy.

ELECTRICITY

The hazards of electricity include:

- Electric shock Through either direct or indirect contact.
- Arcing Electricity of sufficient voltage can 'jump' an air gap, causing electrocution to persons not actually in contact with a conductor.
- Fire Electric current flowing through a conductor generates heat.
- Burns Either through arcing, where the intense heat may cause burns at entry and exit points to the body, or as a result of excessive flow through the body, causing tissue damage.
- Electrostatic charge A high voltage electrical field has the ability to induce a static electrical charge to persons in close proximity to it.
- Capacitors Electrical systems, such as capacitors, often have a considerable amount of electrical energy stored within them that may be earthed through a person who comes into contact with the equipment.

PNEUMATIC

The hazards associated with pneumatic, or compressed air equipment include:

- air embolisms, arising when air is forced through the skin, either through lacerations or through the pores
- physical injury to the hearing or eyes from sudden intense air pressure
- flying particles propelled by compressed air.

HYDRAULIC

Hazards associated with hydraulic equipment includes:

- Hydraulic fluid ejected at high pressure may penetrate human skin (epidermal injection wound), causing fluid to be forced into the bloodstream or surrounding tissue at high pressure
- Eye/skin injuries caused by general contact with hydraulic fluids

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- Leakage of hydraulic fluid may increase the likelihood of slips, trips and falls, particularly if the surface is also wet
- If hydraulic fluid is released at high pressure it will form a mist/aerosol, which may be inhaled. Oil based fluids may cause adverse reactions in the respiratory system (particularly if there is any microbiological contamination). If the oil is ingested via saliva, it may be absorbed and cause problems in the liver.

STORED MECHANICAL ENERGY (KINETIC/POTENTIAL)

Although not an energy source in its own right, if a machine is stopped suddenly, particularly by a blockage, there is often residual energy stored within the system. When the blockage is removed, the energy is released causing the machinery to move with the resultant possibility of entrapment, either of the casualty or his/her rescuers.

Manual handling

Many injuries sustained by firefighters occur on the incident ground due to the unsuitability or handling of equipment, or because of incorrect methods of casualty handling.

Restricted or confined areas in and around machinery where persons are trapped, may exacerbate the potential for manual handling injuries.

Noise

Noise, especially that created by machinery, creates additional hazards to personnel.

If the noise is of such an intensity that normal speech cannot be heard, personnel may not hear (or may mishear) critical safety information; this may expose them and/or others to additional hazards, or increase the level of risk to either/both from existing hazards.

Intense noise may result in hearing loss, either through conductive hearing loss, or sensory-neural (nerve) deafness. Noise induced hearing loss may be temporary or permanent, dependent upon the frequency and intensity of the noise, and the duration of exposure

The presence of noise in darkened environments may result in disorientation and further communications difficulties.

in addition, continuous exposure to high levels of noise may result in:

- temporary threshold shift
- permanent threshold shift
- tinnitus
- deafness
- raised blood pressure
- stress
- interference with sleep
- interference with speech.

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Dealing with casualties and fatalities

Personnel may be exposed to the hazards of blood-borne infections or micro-organisms such as hepatitis B and human immunodeficiency virus (HIV) when dealing with casualties and fatalities. The risk to personnel occurs if blood or body fluids come into contact with the eyes, mouth, or broken skin, and possibly through puncture wounds.

A risk of respiratory infection may be present if the casualty suffers from a disease that is transmitted through coughs etc (e.g. tuberculosis).

A trapped person may panic and start to struggle, resulting in injury to him/herself and possibly, the firefighter. This is particularly the case if the casualty has been drinking alcohol or using drugs.

Trauma/psychological stress

A traumatic incident may be described as *“any situation faced by personnel, which may result in them experiencing unusually strong reactions of an emotional nature, whether at the scene, or at a later time”*.

Examples include:

- fatal or mass casualty incidents, especially those where children are involved
- serious injury or death of a fellow firefighter, family member or friend
- loss of life of a casualty following extraordinary and/or prolonged rescue attempts, especially when involving extensive expenditure of physical and/or emotional energy
- any incident which may attract critical media coverage
- any incident in which the circumstances are so unusual, or the sights and sounds witnessed so distressing, as to produce a highly charged level of emotion, either immediately, or at a later time.

Confined spaces

Rescues from machinery may have to be made in confined or restricted areas. This may include entrapment within the machinery itself or because of the location of the area of work.

Fire service personnel may find it difficult to access such areas for rescue purposes. Working within a confined space or one with restricted access can result in significant risk of injury, due to not being able to conduct manual handling operations in an ergonomic way.

Rescuers may experience heat stress if wearing fire kit in a confined space for any length of time.

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Irrespirable/flamable atmospheres

A significant hazard exists where a rescue is necessary from an area which contains an irrespirable/flamable atmosphere. In addition to the 'normal' considerations involved in the rescue of trapped persons, the additional aspect of the necessity to wear breathing apparatus can be an inhibiting factor, and result in injuries to personnel.

Drowning

A number of additional hazards exist when an incident occurs involving water. There is the possibility that a person or persons can become either trapped by the resultant effect of flowing water, or become trapped within or by an object that could, as a result of the involvement of water, create a serious risk of drowning.

Periods of heavy rain and flash flooding can cause rapid rises in the water level, which will have a serious effect if someone is trapped.

Working at height

There are a number of situations that will involve the casualty being trapped at height and the hazards and control measures identified in Generic Risk Assessment 5.10 – Working at heights should be considered. Additionally, persons may be found in a situation, which although initially not identified as a rescue from height, could result in a fall from height. Such examples could include large industrial machines where the casualty is trapped on top, or within the mechanism.

Dealing with animals

Many entrapments occur on farms and may be in the vicinity of farm animals. These may hinder the progress of the rescue as the animals may have to be removed from the area before the rescue can be undertaken, or they may pose a hazard to personnel and the casualty, at the scene. The hazards and risks involving animals are covered further in Generic Risk Assessment 2.5 – Rescues of large animals.

Key control measures

Planning

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

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

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Site-specific plans should be considered for locations where the hazards and risks are significant and they should take account of and specify any variation from the normal operational capability of personnel, appliances and equipment. In particular, recognition should be given to the physical and psychological pressures that an operational incident may apply to Fire and Rescue Service personnel.

Site-specific plans should 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 Service operational limitations.

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

Information should also be gathered and used to review safe systems of work from sources both within and outside the Fire and Rescue Service, 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 Services should 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 Services 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 Services should consider the benefits of using consistent systems and formats to record information from all sources. Consideration should 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 Service 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.

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Specific planning for incidents relating to this generic risk assessment should include site visits to assist personnel to recognise:

- different types and design of lifts and escalators
- safety features of the machinery
- location and access to motor rooms and control systems
- availability of any on-site engineers with specialist knowledge
- availability and location of equipment operating instructions.

Planning should also lead to the development of standard operating procedures and the provision of suitable specialist equipment.

Competence and training

When formulating a competence and training strategy, Fire and Rescue Services should consider the following points:

- To ensure specific risk assessments for this incident type are suitable and sufficient those tasked with carrying out the assessment and developing procedures are competent to do so
- Fire and Rescue Services must ensure that their personnel are adequately trained to deal with hazards and risks associated with this generic risk assessment
- The level and nature of training undertaken should be shaped by an informed training needs analysis that takes account of Fire and Rescue Service guidance on the competency framework, national occupational standards and any individual training needs
- Training and development programmes should:
 - 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; and
 - 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.
 - also involve personnel involved in other processes that support the emergency response, such as planners devising procedures and people procuring equipment.

Specific training requirements for trapped persons will include the standard operating procedure and the equipment to be used.

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

Site specific tactical exercises should be undertaken with other agencies or staff likely to assist at an actual incident.

Command and control

The Incident Commander should 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.

Communication of new or changed risks should continue during the incident.

Safety Officer(s)

The early appointment of one or more Safety Officer(s) will assist in supporting a tactical plan to address risks so they can be eliminated or reduced to an acceptable level.

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

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

Those undertaking the Safety Officer role should:

- be competent to perform the role
- 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 senior safety officer 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 should be considered by the Incident Commander when determining the supervisory level required.

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Safety Officers should wear nationally recognised identification to indicate that they are undertaking the “Safety Officer” role.

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

Incidents involving lifts or escalators will in most cases involve operations being undertaken at two distinct locations. Safety officers should be nominated on every occasion that a member of a Fire and Rescue Service enters a shaft.

Personal protective equipment

Fire and Rescue Services 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 should also be taken into account. Consideration should also be given to the selection of suitable sizes and gender specific requirements of personal protective equipment.

Personal protective equipment should 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.

When working with machinery there is a significant risk of contamination from a leakage of hydraulic fluid. Individual Fire and Rescue Services should determine the level of personal protective equipment that may be required to perform this task.

If personal protective equipment or individuals are contaminated by body fluids or come into contact with human or animal excrement, the Fire and Rescue Service’s procedures for dealing with contaminated and soiled personal protective equipment should be followed.

If there is any doubt regarding the level or degree of contamination, appropriate scientific or medical advice should be sought.

POST INCIDENT

The following measures should 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 should be recorded, investigated and reported in line with legislative requirements such as *Reporting of Injuries Diseases and Dangerous Occurrence Regulations 1995*, etc

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- arrangements should be in place to either remove all contamination from personal protective equipment or to ensure it's 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 Service'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 e.g. by adding to visit or inspection programme
- staff should 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 should be given to arranging for staff 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 an incident e.g. coroners court, public enquiry, etc.

Specific control measure for release of trapped persons

MACHINERY GENERAL

- Whenever possible, Fire and Rescue Service personnel should consult with site specialist engineers prior to commencing operations
- Machine guards should only be removed once it is confirmed that the power to the machine has been isolated and any moving parts have stopped
- Where machinery safety devices such as brakes and safety interlocks have activated they should not be overridden before careful consideration of the effect of their release. Releasing such safety devices could lead to uncontrolled movement of machinery and further injury to any casualties or rescuers
- Any specific hazards, or safe systems of work which are normally used when accessing the machine, should be identified through consultation with the on site experts/specialists at the incident.

Power Supplies

ELECTRICITY

- seek the advice of the site engineer if available
- isolate power supplies where safe to do so

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- use insulated tools and gloves when working on electrical equipment
- earth systems where necessary
- Fire and Rescue Service personnel to be aware of the contents of Generic Risk Assessment 5.1 – Generic hazards – Electricity.

PNEUMATIC

- seek the advice of the site engineer before working on any plant
- use ear protection and eye protection when working near to pneumatic plant
- where possible and if safe to do so isolate air supplies to plant
- ensure any machinery parts that can move after isolation of pneumatic supply are fully supported or locked off prior to isolation of any air supply.

HYDRAULIC

- seek the advice of the site engineer before working on any plant
- use gloves and eye protection when working near hydraulic plant
- where possible and if safe to do so, isolate hydraulic supplies to plant
- ensure any machinery parts that can move are fully supported or locked off prior to isolation of any hydraulic supply.
- avoid contact with hydraulic fluid and use suitable gloves
- ensure any spillages of hydraulic fluid are cleaned up immediately or covered with suitable absorbent and tapped off
- where a pressure release of hydraulic fluid leads to a mist or aerosol in the atmosphere suitable respiratory protective equipment must be used.

STORED KINETIC/POTENTIAL ENERGY (DUE TO DAMAGED MACHINERY ETC)

- consult with the site engineer prior to working on plant
- lock off or immobilise any plant or machinery that may move following or during rescue operation
- limit the number of personnel in the hazard area
- crews to be fully briefed of the specific hazards of collapse/sudden movement of plant.

Manual Handling

- All Fire and Rescue Service personnel to receive suitable manual handling training
- Fire and Rescue Service personnel only to operate mechanical lifting equipment for which they are trained and competent
- Personnel should ensure that where possible sufficient space is made to enable safe manual handling to be undertaken. Overstretching, pulling or lifting can result in serious injury and the possibility of the rescuer also getting into difficulty

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- The provision of specialist equipment (e.g. heavy rescue equipment) may be necessary.

Noise

- where deemed necessary, use suitable ear protection
- radio communications provided and use with an ear piece system.

Dealing with casualties and fatalities

- Fire and Rescue Service personnel to use suitable gloves and other hand protection systems that provides a barrier against contact with human body fluids
- Fire and Rescue Service personnel should have an understanding of the effects of “crush syndrome” on a casualty who has been trapped for an extended period of time. Where possible medical advice should be sought prior to any attempted removal of trapped casualties.
- For prolonged contact with casualties Incident Commanders may consider the use of suitable respiratory protection
- Fire and Rescue Service personnel should continually communicate with any casualty, reassuring them and informing them of actions the Fire Service is undertaking.

Trauma/psychological stress

- Fire and Rescue Services should consider the use of critical incident stress debriefing sessions/techniques following any identified high stress incident
- Fire and Rescue Services should consider making use of a confidential support line available to all personnel.

Confined spaces

- All Fire and Rescue Service personnel to be aware of the contents of Generic Risk Assessment 2.1 – Generic hazards- Confined spaces
- Fire and Rescue Services to prepare a standard operating procedure for working in confined spaces
- Where it is necessary to enter a confined space to carry out rescues, the Incident Commander should deploy the minimum number of personnel and equipment required to complete the task
- A thorough safety brief prior to deployment of personnel within the hazard zone must be carried out
- Before undertaking any operation that involves working within the confines of the machinery, a full appreciation of the workings of the machine must be obtained. The history of its movement (and subsequent entrapment of the casualty) should be investigated by consultation with the owner/occupier/casualty

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- Confined working/rescue conditions may result in crews becoming quickly fatigued. Incident Commanders should consider frequent rotation of personnel to ensure their welfare
- Use of safety officer/officers when personnel are deployed in confined spaces.

Irrespirable/flammable atmospheres

- where the atmospheric conditions are unknown or are believed to be irrespirable, breathing apparatus must be used
- breathing apparatus crews must receive specific briefings on the hazard and any emergency procedures for evacuation
- atmospheric monitoring equipment, if available, should be carried by personnel in the risk area
- seek the advice from the site engineer to ascertain if mechanical ventilations systems can be used to clear the effected area
- isolate the source of the irrespirable/flammable atmosphere i.e. turn off cylinders or mains supplies
- if the atmosphere is believed to be flammable the Incident Commanders should commit as few resources as possible to the hazard area
- Intrinsically safe electrical equipment should be used in flammable atmospheres
- where safe to do so isolate all ignition sources
- rescue teams to be deployed with suitable and sufficient fire fighting means
- provide covering jets for fire fighting purposes.

Drowning

- Fire and Rescue Service personnel to be aware of the contents of Generic Risk Assessment 2.4 – Rescues – Flooding and water safety
- Fire and Rescue Services to have a standard operating procedure for working on or near water and all personnel to receive training in its implementation.

Working at height

- Fire and Rescue Service personnel to be aware of the contents of Generic Risk Assessment.5.10 – Generic hazards – Working at heights
- Fire and Rescue Service to have a standard operating procedure for working at heights and all personnel to receive training on its implementation
- When carrying out a rescue as identified in this Generic Risk Assessment, and a fall hazard exists for fire and rescue personnel or a casualty, service approved working at height techniques and procedures must be adopted.

Dealing with animals

- Fire and Rescue Service personnel to be aware of the contents of Generic Risk Assessment 2.5 Large animals rescues

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- Fire and Rescue Services to have a standard operating procedure for rescue of animals and all personnel to receive training on its implementation.

Technical references	
1	Manual of Firemanship book 12: Practical Firemanship II
2	Fire Service Manual volume 2: Incident Command (3rd Edition)
3	Fire Service Manual volume 2: Electricity
4	AMT International NEBOSH study note: Noise and hearing protection
6	The Manual Handling Operations Regulations: 1992
7	BS EN 60204-1: 1998: Safety of machinery
8	The Provision and Use of Work Equipment Regulations: 1998
9	PD 5304: 2000: The safe use of machinery

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SECTION 2

Summary of Generic Risk Assessment 2.6

Trapped persons

Ref. No.	Task	Hazard	Risk	Persons at risk	Control measures
1	Access to and egress from the scene of operations	Restrictive access to scene Complex design and minimal space, in and around machinery Uneven/ slippery surface	Manual handling injuries whilst carrying equipment to scene of operations particularly if climbing machinery Injury caused by coming into contact with power source Slips, trips and falls	Operational personnel Other emergency service personnel Public	Operational procedures as per Fire and Rescue Service policy Appropriate supervision Crews to liaise with occupier to determine safe route and isolation of machinery. Provision of suitable lighting.

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Ref. No.	Task	Hazard	Risk	Persons at risk	Control measures
2	Working within the inner cordon	<p>Insufficient scene management</p> <p>Power to the machinery</p> <p>Noise created by machinery</p>	<p>Personnel trip over badly placed equipment or machinery components</p> <p>Electric shock</p> <p>pneumatic/hydraulic injury</p> <p>Crush injuries</p> <p>Impact Injury or cuts and contusions by moving machinery</p> <p>Not hearing safety critical information</p> <p>Temporary or permanent hearing damage</p> <p>Disorientation in darkened environments</p> <p>Over crowding causing confusion</p> <p>Slips, trips, falls cuts, bruises, fractures</p> <p>Psychological stress</p> <p>Post traumatic stress disorder</p>	<p>Operational personnel</p> <p>Other emergency services personnel</p>	<p>Operational procedures as per Fire and Rescue Service policy</p> <p>Command and control</p> <p>Strict control of incident scene</p> <p>Identify equipment pool and area to store removed items from the machinery</p> <p>Provision of suitable lighting.</p> <p>Close liaison with owner/occupier, on-site engineer or technical advisor, to identify isolation devices prior to entering the risk area and before start of operations</p> <p>Personal protective equipment</p> <p>Persons/other agencies to have correct/appropriate personal protective equipment for their tasks when entering inner cordon.</p> <p>Cordon control – Booking in and out system</p> <p>Adequate numbers of personnel to log and monitor</p> <p>Police interaction.</p>

Ref. No.	Task	Hazard	Risk	Persons at risk	Control measures
3	Dismantling machinery/ removing safety guards	Lack of control or coordination as parts are passed Heavy items being moved in confined spaces	Sharp/dangerous parts of machinery contacting personnel Cuts as machinery parts are passed to other personnel	Operational personnel Other emergency services personnel Casualty	Operational procedures as per Fire and Rescue Service policy Ensure sufficient personnel are utilised and controlled Cover exposed areas of danger with suitable temporary measures, particularly if personnel, or the casualty, will need to move in the area Secure moving parts Correct personal protective equipment to be worn at all times.

Ref. No.	Task	Hazard	Risk	Persons at risk	Control measures
4	Working within a confined space	Asphyxiant and toxic gases	Overcome by fumes (asphyxiation/toxic poisoning)	Operational personnel Other emergency services personnel Casualty	<p>Fire and Rescue Service personnel to be aware of the contents of Generic Risk Assessment 2.1 – Generic hazards- Confined spaces</p> <p>Fire and Rescue Services to prepare a standard operating procedure for working in confined spaces</p> <p>Where it is necessary to enter a confined space to carry out rescues the Incident Commander should deploy the minimum number of personnel and equipment required to complete the task.</p> <p>A thorough safety brief prior to deployment of personnel within the hazard zone must be carried out</p> <p>Before undertaking any operation that involves working within the confines of the machinery, a full appreciation of the workings of the machine must be obtained. The history of its movement (and subsequent entrapment of the casualty) should be investigated by consultation with the owner/ occupier/casualty</p> <p>Confined working/rescue conditions may result in crews becoming quickly fatigued. Incident Commanders should consider frequent rotation of personnel to ensure their welfare</p> <p>Use of breathing apparatus</p> <p>Operational procedures to identify possibility of irrespirable atmosphere</p> <p>Equipment to identify lack of O₂ etc</p> <p>Personal protective equipment.</p>

Ref. No.	Task	Hazard	Risk	Persons at risk	Control measures
5	Working in confined spaces	Unable to adopt correct ergonomic position	Manual handling injuries	Operational personnel Other emergency services personnel	Frequent rotation of personnel.
6	Working within proximity of hot/cold machines and adjacent hazards	Contact with extreme temperatures which may be the normal operating temperatures of the machine	Burns Heat exhaustion	Operational personnel Other emergency services personnel	Operational procedures to indicate assessment of machine involved or adjacent machines Isolate power supplies and allow cooling if possible Use appropriate personal protective equipment Frequent rotation of crews Mechanical ventilation (positive pressure fan).
7	Supporting casualty	Casualty falling as machinery is dismantled	Further injury to casualty Injury to rescuers, either attempting to support the casualty or working below	Operational personnel Other emergency services personnel Casualty	Assess area of operation and position of casualty. Use all available information from on-site expertise and medical colleagues Consider use of support from below if available and as appropriate.
8	Removal of small items (e.g. rings, handcuffs etc)	Insufficient clearance to use larger cutting equipment No further dismantling possible, therefore cutting is the only method to be adopted. Incorrect item of small gear utilised	Cuts and contusions to casualty or fire service personnel	Operational personnel Casualty	Correct choice of removal method. Fully assess and pre-plan method to be adopted Keep persons informed of activity at all times, never leave them alone. Reassure, monitor, review, well being.

Ref. No.	Task	Hazard	Risk	Persons at risk	Control measures
9	Assessment and dealing with casualty/first aid	Infected casualty	Contamination by blood/air borne infections	Operational personnel Other emergency services personnel	Correct personal protective equipment worn at all times (e.g. surgical gloves, eye protection etc). Suitable respiratory protection used.
10	General exposure to severely injured casualty	Exposure to view of casualty suffering severe injuries.	Psychological stress (post traumatic stress disorder)	Operational personnel Other emergency services personnel Public	Critical incident debriefing.
11	Fire service operations	Violence from crowd/bystanders (Fire and Rescue Service operations may be complex and slow and may require the waiting for assistance of specialist equipment Public/bystanders/crowds unaware of circumstances therefore abuse/become violent to emergency service personnel Public/bystanders/crowds unaware of circumstances therefore abuse/become violent to emergency service personnel	Cuts, bruises, swelling Unconsciousness	Operational personnel Other emergency services personnel	Crowds/bystanders to be removed and kept at a safe distance Personnel should not enter into dialogue or exacerbate situation for crowd/public control Training/awareness.