

# Fire and Rescue Service Operational Guidance

# GRAs

generic risk assessments

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## **GRA 4.2**

Incidents involving  
transport systems – rail

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# **Generic Risk Assessment 4.2**

Incidents involving  
transport systems – rail

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## SECTION 1

# Generic risk assessment 4.2

## Incidents involving transport systems – rail

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### Scope

This generic risk assessment is a guide to the generic hazards, risks and related control measures for discharging the duties of the Fire and Rescue Services Act 2004, when attending incidents on rail systems. A rail system can be described as:

‘Transport infrastructure and vehicles managed for the mass transport of people or goods, guided by one or more fixed rails’.

This description is intended to include national rail, metro, tram and heritage rail networks. This may also include temporary rail systems. It will also be useful to fire and rescue services when dealing with incidents on rail systems associated with dockyards, nuclear installations, quarries or other large industrial undertakings.

Fire and Rescue Services will recognise that other hazards may exist while working on the rail system. Those that are not specific to railways (e.g. manual handling) are recorded elsewhere.

The complex and variable nature of rail systems is such that Fire and Rescue Services must ensure local knowledge is updated and maintained to ensure operational plans remain current. This generic risk assessment will assist Services to undertake specific local risk assessments and develop mitigation and control measures.

### Significant hazards and risks

The significant hazards and risks that Fire and Rescue Service personnel face when attending incidents on the rail system fall into a number of categories:

#### **The operational imperative**

On the arrival of crews, there will be an expectation of action. Crews should be aware of the pressure to act, particularly when large crowds are at the scene of a serious incident.

## Limited experience

Working on or near railways are instances where the experience of the Fire and Rescue Service is limited. A particular hazard is the infrequency of rescues performed in these conditions and the societal/moral pressure on Fire and Rescue Service personnel to save life regardless of resources, training and experience.

## Moving rail stock

Persons working on or near the rail system may be struck by moving rail vehicles. Factors influencing the likelihood are:

### RAIL VEHICLE SPEED

Approaching rail vehicles can be very quiet, can appear from either direction on the track and can travel up to 200 km/h (125 mph). At these speeds stopping distances can be 1.6 km (1 mile) and may make it impossible to bring the rail vehicle to a stop before reaching the scene of operations. High speed and international services can operate at speeds of 300 km/h (186 mph) and the stopping distances during emergency braking may be increased to 4.5 km (2.78 miles). Furthermore, it may be difficult to discern the speed of any approaching rail vehicle and therefore safely predict the time available to move to a place of safety. This may be further influenced by conditions affecting visibility including weather conditions, time of day, track geometry and topography of the surrounding area.

### AIR TURBULENCE

When a train is moving it creates air turbulence. This turbulence, in turn, forms an area of low pressure adjacent to the carriages. Personnel standing close to a passing train are in danger of being sucked towards it.

### RAIL VEHICLE MOVEMENTS AFTER ELECTRICAL TRACTION CURRENT ISOLATED OR SIGNALS SET TO STOP

*Coasting rail vehicles:*

Rail vehicles driven by electrical traction current will build up significant momentum. This momentum allows vehicles to travel considerable distances after the power is shut down. This poses a potential collision hazard as trains may still be moving at speed.

*Other motive power systems:*

Rail vehicles driven by power systems other than electrical traction current, often utilise the same rail system. It must be borne in mind that these vehicles may travel some distance before reaching a stop signal and therefore still pose a threat to safety despite the removal of traction current.

## Power systems

Rail vehicles use one or more of the following types of traction power: electricity, diesel, steam or battery.

### ELECTRIFIED RAIL

Some rail vehicles draw a traction power from a low level electrified rail. The variations of these systems are referred to as 'third rail' or 'fourth rail'. If people come into contact with any electrified rail it may result in serious injury or death.

Additional hazards are associated with trains 'bridging' live and isolated sections of track.

### **OVERHEAD LINE EQUIPMENT (OLE OR OHLE) – ALSO KNOWN AS CATENARY**

Some rail vehicles obtain power from overhead electrified power lines. When operating these lines can arc a distance of three metres. The likelihood of arcing increases in conditions of dense smoke or high humidity. Where power to the line has been shut down, residual current can remain until earthed or electrical current may be induced from nearby electrical power cables that remain live. If people come into contact with live or unearthed overhead line equipment it may result in injury or death.

Overhead line equipment may be under tension and therefore if damaged could collapse. In these circumstances overhead line equipment could recoil with force, remaining electrically charged until safely isolated and earthed.

### **DIESEL SYSTEMS**

Diesel powered vehicles carry a large onboard fuel supply. Isolation of the electrified rail will not cause them to stop moving. There is often some distance between stop signals and therefore diesel vehicles can travel some time before coming to a halt. Diesel vehicles will also carry an electrical battery supply.

### **COMBINED SYSTEM**

A combination of electrified rail and overhead line equipment and/or battery power may be utilised in certain areas. This may pose a hazard as sources of power may require individual isolation.

### **STEAM**

A number of rail systems use and maintain vehicles powered by steam. On occasions these vehicles can be found on the National Rail Network. Hazards associated with these vehicles include:

- steam and high pressure steam
- fire spreading to the surrounding environment from the fire box
- high fire load associated with vehicle and solid fuel supply.

### **BATTERY SUPPLY**

Rail vehicles routinely include battery power back up to support onboard systems such as lighting and air conditioning. There is a risk of injury to personnel from live electrical equipment even after isolation of the main electrical supply.

### **UTILITIES, THIRD PARTY SUPPLIES AND POWER SYSTEMS TO POINTS AND SIGNALLING**

The railway network is used to provide a conduit for utilities, including gas pipes and third party electrical suppliers (e.g. National Grid power cables or other rail system's high voltage electrical supplies). This may present a hazard until appropriate control measures can be put into place.

Following isolation of the main traction current, electrical power supply points and signalling will remain live and will continue to present a hazard to personnel.

## Rail infrastructure

The railway's built environment has developed over many decades with varying facilities to assist Fire and Rescue Service intervention. Construction and topography of the rail system varies widely and will have an affect on Fire and Rescue Service operations and safe systems of work. An incident on railway infrastructure may occur at one or more of the following locations:

- surface railway including cuttings, embankments, level crossings, the public highway and footpaths
- 'over' and 'under' bridges
- viaducts
- platforms
- tunnels.

These locations may be found in rural or urban areas. Hazards that can be associated with the infrastructure include:

- poor communications
- vermin infestation (zoonose infection)
- anti-social behaviour (needlesticks, vandalism, faeces)
- restricted or confined working areas
- long travel distances, difficult access/egress, manual handling and associated fatiguing conditions
- risk of becoming trapped by movement of rail points
- liquefied petroleum gas (LPG) cylinders used to power points in remote locations
- signalling and technical equipment with local electrical power supply
- hazard from the storage, transport and use of train warning detonators by rail professionals
- third party electrical equipment
- weakening of embankment or cutting by run-off from high volume water pumping operations or flooding
- displacement of ballast causing rails to sink
- exposure to extreme weather
- slips, trips and falls associated with steep and slippery surfaces
- poor lighting conditions
- derelict or disused premises on the infrastructure
- limited firefighting facilities at some locations.



Some areas of the rail network present additional risk due to the complexity of the location. These locations can include large rail termini, junctions, regional stations or where rail lines are used by more than one rail system.

They are characterised by:

- the number of rail systems operating in the area
- rail vehicle movements being under the control of different rail system operators or different controls.

The risk to the Fire and Rescue Service at these locations may be increased by:

- potential delay in identifying rail system operators or controls responsible or affected by the incident
- potential delay in obtaining confirmation that appropriate control measures have been applied to the area
- the variation in the provision of Fire and Rescue Service facilities over a large area (e.g. water supplies, access)
- Fire and Rescue Service equipment operating over a large area (e.g. branches, power cables).

### **DEPOTS, SIDINGS AND YARDS**

Depots, sidings and yards may be owned, and/or operated under separate personnel, facilities and train movement management systems. Power supplies may be managed locally or remotely. Information on facilities and processes may not be readily available.

### **TUNNELS, VIADUCTS, CUTTINGS AND BRIDGES**

Incidents occurring at these locations may present additional hazards associated with the following:

- delay in reconnaissance to identify the location and type of incident and subsequent difficulties estimating resource requirements
- delay in getting resources to the scene
- restricted access
- limited water run-off facilities
- limited places of safety or refuge
- use of bi-directional trains
- ineffective radio communications.

### **Rail vehicles construction and use**

Railway systems may permit various rail vehicles carrying people or goods or providing a function to the railway (e.g. maintaining rail lines). A single network can have a wide range of vehicles in use which encompass many decades of development and technology.

The local Fire and Rescue Service should identify the type of rail vehicles that personnel are likely to encounter when responding to incidents through routine liaison, and section 7(2)(d) and 9(3)(d) visits.

General hazards associated with carriages and freight include:

- size
- speed
- weight
- materials of construction (e.g. asbestos, wood, aluminium, toughened glass)
- open wide gangways in passenger carriages allowing combustion and contaminants to spread freely
- liquefied petroleum gas/diesel/steam used for various purposes including heating, fuel and cleaning
- high pressure fluids as components of the vehicle's safety and running systems
- hazardous materials and freight including explosives, radioactive or irradiated materials
- multi load of hazardous and non-hazardous materials
- on board electrical system, for example, air conditioning units
- technical and maintenance equipment including grinding, laser and isotope equipment carried on a range of specialist vehicles for railway maintenance.
- passengers.

## **Community impact**

Various rail systems have a range of local, national and international dependencies that can affect public, leisure and business activities as well as other rail systems.

Incident Commanders should be mindful of the impact even minor rail incidents can have over the wider area. Risks associated include:

- overcrowding at stations and on platforms
- trains stopped between stations
- people detained on trains at inaccessible locations
- overcrowding on trains and trains held in tunnels causing dehydration, heat stress and people becoming unwell
- potential for passenger to alight from trains between stations
- the possible adverse impact on business continuity and major community events
- the potential for these factors to combine or become wide spread causing a major incident for the emergency services and rail system operators.

# Key control measures

## Planning

Pre-planning is key to enhancing the safety of firefighters and others likely to be affected by Fire and Rescue Service's operations. Each Service's Integrated Risk Management Plan 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 and site-specific plans should be considered for locations where these are significant. This assessment should include any other Fire and Rescue Service's areas where cross-border arrangements make this appropriate, including across national boundaries.

Such contingency plans should include:

- levels of response
- reference to relevant standard operating procedures (SOPs)
- tactical considerations including rendezvous points (RVPs), appliance marshalling areas and access points
- fixed installations
- communication systems.

Pre-planning is underpinned by information gathering, much of which will be gained through inspections or visits by Fire and Rescue Service staff – 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 forum.

Involving others in pre-planning is also 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 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 information to support operational decision-making.

Information needs and the capacity of Fire and Rescue Service staff to assimilate information will vary, in proportion to the nature and size of incident and what stage the operational response has reached, so arrangements need to be flexible and may be based on more than one system.

Knowledge of the intervention strategy design for the rail environment and Fire and Rescue Service personnel being aware of the environment they will be operating in will assist with the reduction of risk. Issues associated with problematic communication, confined spaces, travel distances and manual handling can be addressed by pre-planning and determining the appropriate initial response. For complex infrastructure, or depots and sidings, pre-plans and tested communication arrangements should be put in place.

To effectively manage a rail incident it is essential that Fire and Rescue Service responders have a suitable awareness of the nature and complexity of the rail infrastructure they are attending. This will include:

- information on the intervention strategy for the system or location
- facilities available to operational personnel
- relationship of the system or location with other rail systems
- type of vehicles likely to be encountered, and associated hazards
- identification of hazards and procedures for ensuring appropriate control measures are implemented
- arrangements for the attendance of a 'Responsible Person at Silver' appropriate to the rail systems a Fire and Rescue Service may respond to
- knowledge of the rail system's command and control arrangements and emergency plans
- knowledge of evacuation procedures
- knowledge that terminology differs between rail systems.

These factors will be supported by effective plans and local operational procedures drawn up through consultation and tested by way of regular, realistic exercise where reasonably practicable.

### **Pre-determined response**

Fire and Rescue Services should ensure that the operational response to an incident will be sufficient to allow relevant safe systems of working to be implemented. A task analysis of the various scenarios at this type of incident will enable a Fire and Rescue Service to plan an effective response. This together with any known site specific information will provide a risk based assessment of the pre-determined response.

As part of the pre-planning process the pre-determined response may also include the need for: specialist vehicles; specialist equipment, techniques and assistance from other agencies.

## Training

When formulating a training strategy a Fire and Rescue Service should consider the following points:

- they must ensure their personnel are adequately trained to deal with hazards and risks associated with working on and dealing with incidents involving railways
- the level and nature of training undertaken should be shaped by informed assessment of operational and individual needs in accordance with the Fire and Rescue Service's guidance on the Integrated Personal Development System, National Occupational Standards and any internal training plan.
- training and development should follow the principles set out in national guidance documents
- training and development programmes should generally be structured so that they move from simple to more complex tasks and from lower to higher levels of risk
- training and development will 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
- training and development programmes need to 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.

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

## 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 into account all factors known at the time before selecting and informing personnel of the safe system of work to be implemented.

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

Due to the complexity and integrated nature of the rail industry an incident involving rail infrastructure will require the support, coordination and liaison between emergency services and other responders including rail professionals, local authorities and statutory investigators.

The Incident Commander must choose the most appropriate safe systems of working based on pre-planning by their Fire and Rescue Service and the pre-determined attendance for this type of incident. In doing so they shall take account of the guidance provided by the National Incident Command System the following control measures are particularly pertinent to rail incidents:

- appropriate and proportional control over the rail system or systems involved
- minimum numbers of personnel and equipment committed to work on or near the railway
- crews to be rigged in appropriate personal protective equipment including visibility markings
- accurately identify the location of the incident
- initiate early reconnaissance in order to establish the most suitable command area for the likely duration of the incident
- it may be necessary to brief and deploy Safety Officers to warn of approaching rail vehicles and implement action
- utilise best access and egress balanced against urgency of the situation
- the Incident Commander must identify and communicate the extent of the area in which it will be safe to work.

As the incident develops the Incident Commander should consult with the responsible person to maintain a safe area of operations, confirming safe access and egress routes from the scene.

In many rail incidents the first effort to assist will often be undertaken by the public and any rail staff nearby. In these circumstances those who are helping with casualties should be led to safety as soon as reasonably practicable. Arrangements should be made for these people to report to a location to ensure their evidence value and welfare needs are identified.

### **Liaison with ‘Responsible Person at Silver’**

The attendance of a responsible person from the rail system’s infrastructure management will assist the Incident Commander to confirm that the hazards identified and the control measures instigated are suitable, sufficient and proportionate. This person, known as the ‘Responsible Person at Silver’ for Fire and Rescue Service purposes, will have the authority, knowledge, training and experience to provide liaison and advice to the Incident Commander at ‘silver’ level, to support the overall plan. Other functions that may be provided include:

- implementing additional on-site control measures (e.g. making points safe, identifying power/utility owners)
- suggesting methods of reducing community impact
- supplying specialist equipment and advice

- providing information on rail vehicles
- providing information on rail infrastructure (for example the tenancy of railway arches, processes in specific location)
- proposals for the early restoration of service.

It must be remembered that not all rail professionals (in or out of uniform) can be assumed to be the 'Responsible Person at Silver' within the meaning of this generic risk assessment.

Incident Commanders should ask for identification and send a message to the rail system's control confirming the name of the person providing 'silver' liaison at the scene.

Prior to the arrival of the Responsible Person, information on the nature of the freight involved in any incident can be obtained through a request to the rail system's control, via Fire and Rescue Service control.

## **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 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 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.

A Safety Officer can be any role, 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.

Safety Officers should wear nationally recognised identification to indicate 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.

## **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. The standard of clothing worn beneath the specialist personal protective equipment should also be taken into account.

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.

## **Communications**

It is essential that those in initial attendance at all rail incidents make contact with the rail system's controllers via Fire and Rescue Service control. It is also essential for timely, clear, accurate messages to be relayed between the Incident Commander and the rail operator via the Fire and Rescue Service control. These messages and the responses are essential elements of safe systems of work for the Service and rail operations both at the scene, and in other locations.

Following any exchange of messages the response to the request must be relayed by the Fire and Rescue Service control to either the Incident Commander or the rail operator as soon as possible. This is vital to ensure that understanding of the safety levels in place is known and understood by all parties.

Once a rail operator's responsible person has identified themselves to the Incident Commander, information and the Fire and Rescue Service's requirements can then be requested via that individual. It remains important however, for Fire and Rescue Service control to be kept informed by means of formal messages of the requests, and actions taken at the scene.

Because of the fixed location of the rail infrastructure it is advisable that Fire and Rescue Services produce contingency plans that identify and address any variation in the reliability of communications at different locations within the infrastructure.

## **Rail vehicle and power system control**

Incidents may involve people on or near the railway. 'On or near the railway' means the presence of personnel or equipment on railway infrastructure with the potential for harm to people or property. The Incident Commander of the initial attendance must contact their Fire and Rescue Service control to request an appropriate level of control over rail traffic movements and any need for isolation. The four levels of control are:



1. Inform the rail system control of an occurrence (for example a lorry wedged under a rail bridge) where no damage to the rail line is obvious, but a physical assessment by rail infrastructure specialists would be prudent. This level of control is not appropriate for committing personnel on or near the railway, and the rail system will determine the appropriate level of control over vehicle movement and power systems.
2. 'Run at caution' – train drivers are informed that there is an incident on or near the railway. The driver reduces speed in the area to ensure they can stop safely. Fire and Rescue Service crews will need to be aware that trains running at caution could still proceed at relatively high speed.
3. 'Trains stopped' – trains will be stopped by the rail operator using train signals or radio messages. It may take time to confirm that all trains have been stopped.
4. 'Trains stopped and power off' (for overhead line equipment the electrical supply will need to be earthed, in addition to power off, to obtain electrical safety).

More than one level of control may be appropriate for incidents.

For rail systems operating driverless vehicles not all control measures will be appropriate.

Fire and Rescue Service crews must be aware that by isolating the traction current within one section of the rail infrastructure there are significant implications in terms of the widespread safety and control of trains, possibly nationwide. This may result in some delay in the isolation of traction current being achieved.

Incident Commanders must remain aware of the fact that not all power sources on or adjacent to the rail infrastructure are under the control of Network Rail/rail operators. It is, therefore, vital that when requesting a shutdown, every effort is made to identify whose equipment/cable is involved. It must also be remembered that traction current shut down or isolation means just that. No other electrical supplies will be shut down or isolated.

Fire and Rescue Service personnel should not normally be committed to the track until the required level of control has been implemented. This must be confirmed by the appropriate rail control, via Fire and Rescue Service control, or the on site responsible person if available. Safety Officers should be positioned to warn of rail vehicle movement from all rail lines close to the incident, until the arrival of the responsible person, or relieved by rail professionals trained as look-outs.

It is recognised that there may be situations when a minimum number of Fire and Rescue Service personnel will be committed on or near the railway to save or rescue endangered human life. In these circumstances a priority message to that effect should be transmitted to Fire and Rescue Service control to inform the rail system controller:

- personnel are on the railway
- the location of the operation
- nature of their task.

Safety Officers must be appointed to look out for approaching trains. Appropriate evacuation signals and subsequent action must be determined in the circumstances. The likely speeds of rail vehicles and appropriate stopping distances must be taken into account.

### **Built environment associated with rail infrastructure**

Additional to the hazards and risks contained in this document, when formulating tactical plans at rail incidents, Incident Commanders should be cognisant of the additional hazards posed by the surrounding environment. This may require the need to implement control measures for non-rail specific hazards, for example

- working at height
- working near open water
- confined space working.

Fire and Rescue Service personnel should take notice of any warning signage provided for emergency service personnel and Incident Commanders should ensure this information informs tactical planning. Signage may include instruction for:

- ventilation control
- access
- opening of doors
- limits on clearance for people on the line
- operating of water supplies.

Viaducts, bridges and tunnels present additional risks. In normal circumstances the Incident Commander should not commit firefighters 'on or near' these locations unless confirmation has been received that appropriate controls are in place.

The use of equipment, such as ladders, increases the risk of contact with electrical equipment (e.g. overhead line equipment) and appropriate control over the power system, clear briefings and the appointment of Safety Officers should be considered.

The rail infrastructure should not be used as a reservoir to remove large volumes of water. This is particularly the case for high volume pump operations where the volume of water involved can undermine the ballast allowing the running rails to sink.

When moving on the railway care should be taken to avoid trapping feet between point blades, which can operate independently and after electrical isolation of the traction current. Personnel should not walk on any rail.

Good hygiene practices should be observed to prevent infection, with cuts and grazes being covered and kept clean.

## Post-incident

The following measures, as appropriate to the nature and scale of the incident, should be considered to help eliminate or remove risks after an 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 the Reporting of Injuries, Diseases and Dangerous Occurrences Regulations 1995, etc.
- 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 procedures
- consider any changes required to safe systems of work, appliances or equipment in the light of any lessons learned from de-briefs 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 pre-planning, e.g. by adding to visit or inspection programme
- consider the need to refer to other agencies any concerns or issues that are identified at an incident, e.g. referral of vulnerable person to social services. When sharing information, due regard must be paid to the need for confidentiality and the legal requirements arising from the Data Protection Act
- staff should be supported and monitored to identify whether they are experiencing any adverse affects and to check whether they would benefit from accessing counseling 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 any incident e.g. coroners court, public enquiry, etc.

## SECTION 2

### Summary of Generic Risk Assessment 4.2

#### Incidents involving transport

Ref. No.	Activity	Hazard	Risk	Persons at risk	Control measures
1	Operations involving rail network and rolling stock	Inadequate preparedness for operational type	Fatality Major injury	FRS personnel Members of the public Other agencies	FRS to identify, risk assess, plan, train and adequately control all reasonably foreseeable types of operational incident where working on rail network or rolling stock can be expected  FRS to gather and record appropriate information  FRS to ensure that crews and supervisors are adequately trained and competent  Ensuring they undertake regular training and exercises for generic and specific risks in their area  FRS to ensure operational instructions are in place  FRS to ensure that adequate systems are in place to notify personnel about incident weather e.g. the possibility of ice  FRS to ensure the provision of appropriate equipment to support safe systems of work

Ref. No.	Activity	Hazard	Risk	Persons at risk	Control measures
2	Attendance at incidents involving rail network and rolling stock	Failure to establish a safe system of work	Fatality Major injury	FRS personnel Members of the public Other agencies	<p>FRS to ensure that appropriate predetermined response procedures are in place</p> <p>FRS to ensure that an equipment management system is in place to comply with relevant legislation</p> <p>FRS to consider an effective plan to rescue personnel</p> <p>FRS to ensure effective liaison between other agencies</p> <p>FRS to provide appropriate information, instruction and training on how to deal with moral pressure at incident scenes.</p> <p>FRS to ensure that sufficient resources are mobilised to this type of incident</p> <p>If appropriate resources have not arrived on scene (as part of the initial response) to establish a safe systems of work, the FRS should consider the use of a suitable RV point away from the incident</p> <p>FRS to ensure information gathered is available to responding personnel</p> <p>Incident Commander (IC) to establish appropriate Incident Command System (ICS) and risk management procedures</p> <p>IC to adopt a default to defensive mode until suitable safe system of work is established</p> <p>IC to deliver safety briefing on known/anticipated hazards and control measures IC to consider deploying safety officer</p> <p>IC to give consideration to establishing cordons and ensuring appropriate supervision of zones.</p>

Ref. No.	Activity	Hazard	Risk	Persons at risk	Control measures
3	Gaining access to rail system at controlled entry points (e.g. stations and termini)	Large numbers of members of public impinging on FRS operations	Delay in delivery of service resulting in increased risk of injury or death	FRS personnel Other agencies Public	Command and control Communications Local knowledge, planning Liaison with responsible person Local intervention strategies Built environment control Information/instruction/training/supervision.
4	Gaining access to rail system in remote or uncontrolled locations	Collision with or struck by rail vehicle Contact with traction current Complexity of rail infrastructure Difficult communications Zoonoses infection Vandalism and societal hazards	Death or serious injury and infection	FRS personnel Other agencies Public to take into account self rescuers	Command and control Communications Local knowledge, planning Liaison with responsible person Vehicle and power system control Local intervention strategies Built environment control Information/instruction/training/supervision PPE.
5	Establishing safe scene of operations	Collision with or struck by rail vehicle Contact with traction current Complexity of rail infrastructure	Death or serious injury and infection	FRS personnel Other agencies Public	Command and control Communications Local knowledge, planning Liaison with responsible person Vehicle and power system control Local intervention strategies Information/instruction/training/supervision.

Ref. No.	Activity	Hazard	Risk	Persons at risk	Control measures
6	Management of isolating traction current and earthing of OLE	Collision with or struck by rail vehicle Contact with traction current Complexity of rail infrastructure Non-traction current driven vehicle still active	Death or serious injury and incident escalation	FRS personnel Other agencies Public	Command and control Communications Local knowledge, planning Liaison with responsible person Vehicle and power system control Local Intervention strategies Information/instruction/training/supervision.
7	Search and rescue including extrication activities	Access and egress to scene of operations Manual handling of equipment over long distances Unstable carriages Contact with undischarged traction current (OLE) Working at height Confined space working	Death or serious injury	FRS personnel Other agencies Public	Command and control Communications Local knowledge, planning Liaison with responsible person Vehicle and power system control Local intervention strategies Information/instruction/training/supervision PPE.
8	Evacuation of public from scene of operations	Access and egress to scene of operations Poor light conditions Inclement weather Ineffective control of evacuees Contact with traction current Self evacuation Overcrowding at stations/platforms	Death or serious injury	FRS personnel Other agencies Public	Command and control Communications Local knowledge, planning Liaison with responsible person Vehicle and power system control Liaison with Local Authority Liaison Officer (LALO) Local intervention strategies Information/instruction/training/supervision.

Ref. No.	Activity	Hazard	Risk	Persons at risk	Control measures
9	Firefighting	<p>Access and egress to scene of operations</p> <p>Poor water supplies</p> <p>Extinguishing media coming into contact with traction current</p> <p>Extinguishing media coming into contact with arcing from OLE through ionized smoke plume</p> <p>Trackside equipment still live after traction current isolated (points and signals)</p> <p>Working at height</p> <p>Confined space working</p> <p>Presence of large numbers of passengers</p>	Death or serious injury	FRS personnel Public	<p>Command and control</p> <p>Communications</p> <p>Local knowledge, planning</p> <p>Liaison with responsible person</p> <p>Vehicle and power system control</p> <p>Local intervention strategies</p> <p>Information/instruction/training/supervision</p> <p>PPE.</p>
10	Control of hazardous materials	<p>Access and egress to scene of operations</p> <p>Manual handling of equipment over long distances</p> <p>Multiple loads</p> <p>Presence of large numbers of passengers</p>	Death or serious injury or environmental damage	FRS personnel Other agencies Public	<p>Command and control</p> <p>Communications</p> <p>Local knowledge, planning</p> <p>Liaison with responsible person</p> <p>Vehicle and power system control</p> <p>Local intervention strategies</p> <p>Information/instruction/training/supervision</p> <p>PPE.</p>



Ref. No.	Activity	Hazard	Risk	Persons at risk	Control measures
11	Environmental protection	<p>Access and egress to scene of operations</p> <p>Manual handling of equipment over long distances</p> <p>Multiple loads</p> <p>Uncontrolled substance run off</p>	<p>Death or serious injury or environmental damage</p>	<p>FRS personnel</p> <p>Other agencies</p> <p>Public</p>	<p>Command and control</p> <p>Communications</p> <p>Local knowledge, planning</p> <p>Liaison with responsible person</p> <p>Local intervention strategies</p> <p>Information/instruction/training/supervision.</p>
12	Reinstatement and post-incident actions	<p>Access and egress to scene of operations</p> <p>Manual handling of equipment over long distances</p> <p>Complexity of rail infrastructure</p> <p>Collision with or struck by rail vehicle.</p> <p>Contact with traction current</p> <p>Psychological trauma</p> <p>Inability to contribute to enquiries/investigations</p>	<p>Death or serious injury</p> <p>Ineffective response to enquiries leading to reputational damage</p>	<p>FRS personnel</p> <p>Other agencies</p>	<p>Command and control</p> <p>Communications</p> <p>Local knowledge, planning</p> <p>Liaison with responsible person</p> <p>Vehicle and power system control</p> <p>Local intervention strategies</p> <p>Information/instruction/training/supervision</p> <p>Access to counselling.</p>