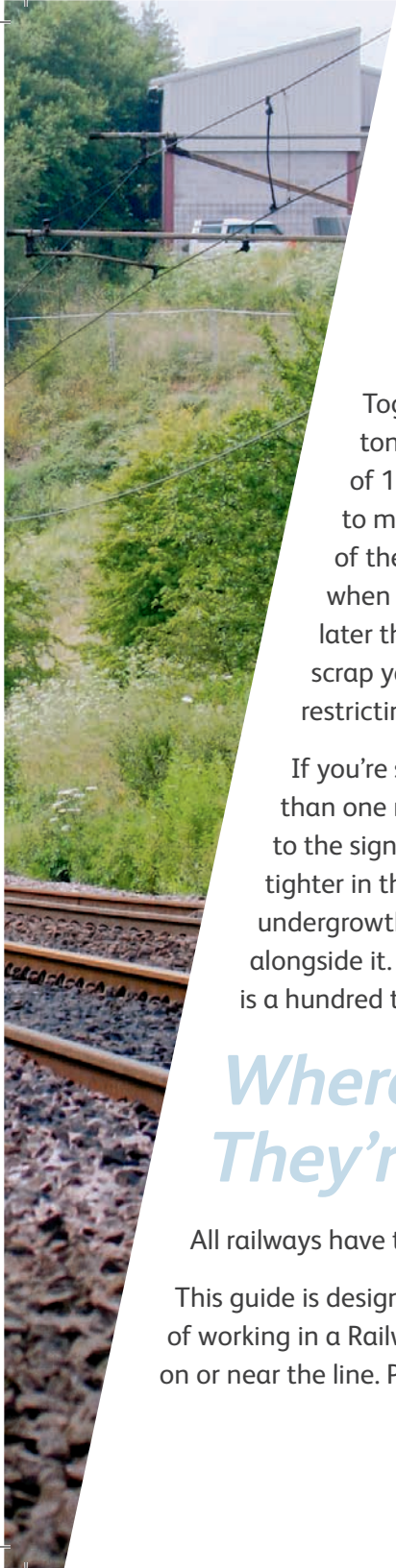


*A Guide to
Personal
Track Safety*

Where are the dangers here?





Together, these two trains weigh around 1,000 tonnes and are passing at a combined speed of 150 mph. A gentle breeze creates enough noise to mask the sound of their approach and, because of the track curvature, you only catch sight of them when they are just 300 metres away – eight seconds later they are rattling past. Smoke from a nearby scrap yard blows across the track from time to time, restricting visibility even further.

If you're standing by the lineside cabinet, there's less than one metre between you and the train. Crossing to the signal is almost impossible. Clearances are even tighter in the tunnel. There's a short length of rail in the undergrowth – easy to trip over – with a loose drain cover alongside it. The voltage in the overhead equipment is a hundred times greater than your supply at home.

Where are the dangers? They're everywhere.

All railways have their risks, but none of them have to be killers.

This guide is designed to remind you of the dangers and hazards of working in a Railway Environment; it is your route to safe working on or near the line. Please take time to study this guide.

Personal Track Safety, known as PTS, is a qualification required by people who –

- go on a line
- go within 3 metres (10 feet) of a line on the railway side of any permanent fence or structure
- carry out engineering or technical work on a platform within 1.25 metres (4 feet) of its edge.

This handbook covers the rules, which must be applied in these situations by Sentinel track safety card holders, Signallers and Crossing Keepers and visitors to the infrastructure who have a Track Visitor Permit. It also contains useful information for other railway workers.

The handbook does not cover –

- local instructions
- lines on which trains are allowed to travel at more than 125 mph.

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1 *Getting to know the infrastructure*

You'll need to have some knowledge of the railway infrastructure to apply the rules in this handbook properly and safely. This section gives you the basics. Whether it's a busy multi-track area or a little-used branch line, every section of railway is unique and each has its own dangers.

1.1 Track layout

A running line is a line used by trains to go from place to place. Each running line has a name – for example the Up Main or Down Goods – and a speed limit. Details are given in a document called the Sectional Appendix.

The picture below shows a railway with two tracks – one for each direction. Trains travel away from the camera on the left-hand track – in this case called the Down Main line – and towards the camera on the right-hand track – the Up Main. Here the speed limit on both is 75 mph.



Sometimes trains can travel in both directions on the same track. This is either a bi-directional line or, if it's the only track, a single line. The pictures below show the Down/Up Huddersfield line. Here the speed limit depends on the type of train – either 35 mph or 50 mph – but always assume trains will approach at the higher speed.



Some busy railways have four or more lines. In the picture below, the two tracks to the left – the Up and Down Slow lines – have a speed limit of 100 mph. To the right are the Up and Down Fast lines, with trains allowed to travel at 125 mph. Up is towards the principal city or town and Down is away from the principal city or town.



If a line has been blocked for some reason, trains can be authorised to travel along another open line in either direction, known as single line working. Points and crossovers are used by trains to go from one line to another. Generally, points are operated from a signal box and have an identifying number displayed on them.



In the pictures below, the camera is looking in the direction trains travel. The points on the left are 'facing' – they allow trains to leave the line – whilst, on the right, they are 'trailing' – allowing trains to join. The speed limit usually changes in these junction areas, but not always.



Near stations the track layout can be complex with many lines, with several sets of points and crossovers with trains entering and leaving the station at the same time from different directions.



There are hundreds of sidings on the railway network, as well as depots and yards. These are used to store trains and other railway vehicles when they are not in use. Sidings, depots and yards are not running lines and are not usually shown in the Sectional Appendix.



Mileposts are positioned alongside the railway – usually every quarter of a mile – to help identify the location.



1.2 Terminology

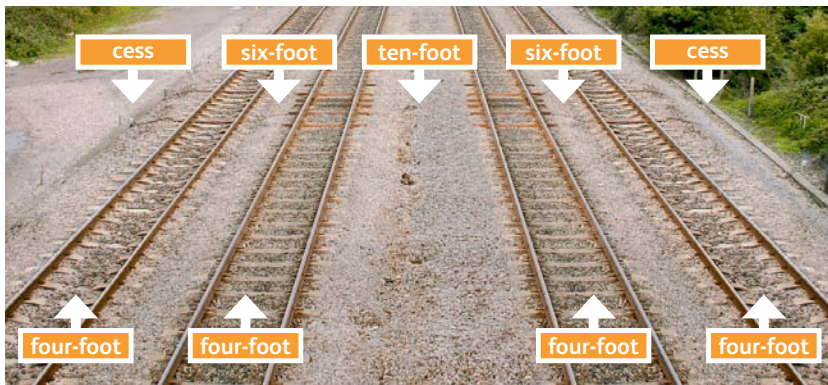
The picture below shows the terms used to describe parts of the track –



- running rails are the two rails that a train's wheels run on
- sleepers support the rails and keep them the correct distance apart
- fastenings hold the running rails to the sleepers
- ballast keeps the track in place.

In this handbook, when distances are given 'from the nearest line', the measurement is taken from the nearest running rail of that line.

This picture shows the terms used to describe parts of the railway –



- the cess is the area alongside the railway
- the four-foot is the space between the running rails of one line
- the six-foot is the space between a pair of lines if they're the normal distance apart.

Sometimes, if there are three or more lines, a wider space is provided between two of the lines. This is known as the ten-foot, or a wideway.

Be aware, these are just terms not measurements.

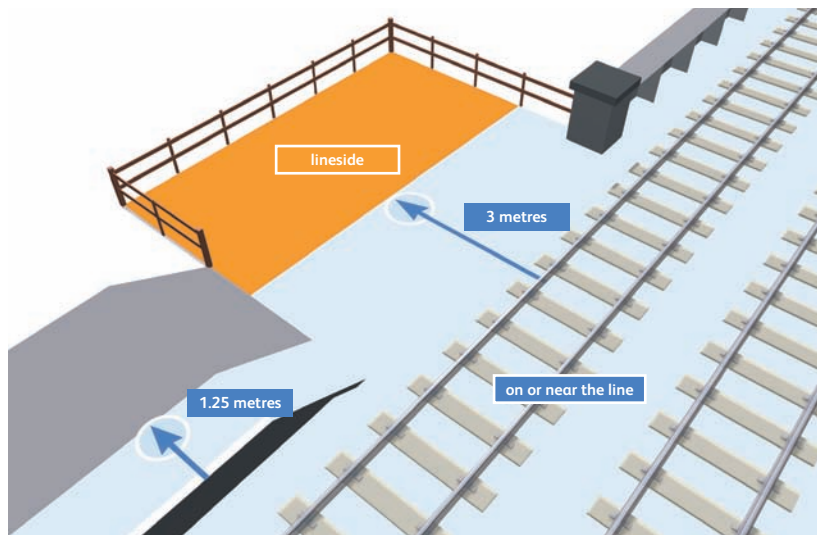
On or near the line and lineside

The diagram below shows two important terms.

You are 'on or near the line' and in danger from trains if –

- you are on a line
- you are within 3 metres (10 feet) of a line and there is no permanent fence or structure between you and the line
- you are doing engineering or technical work on a station platform within 1.25 metres (4 feet) of its edge.

These areas are shown below.



You are not on or near the line if you are crossing the line at a level crossing.

You are on the lineside if –

- you are within the railway boundary but not on or near the line, and
- you can be seen by the driver of an approaching train.

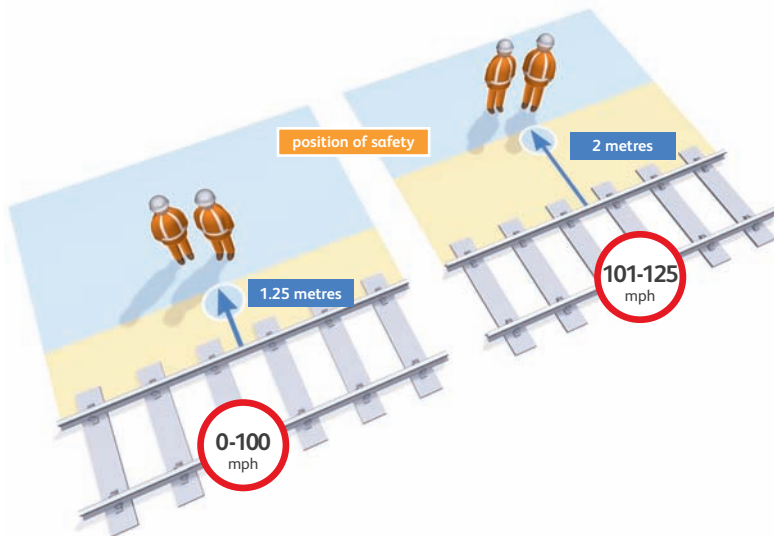
These areas are shown in orange on the diagram on page 15.

You are not on the lineside if you are on a station platform.

Position of safety

A position of safety is a place where it is safe to stand when a train is passing.

You are in a position of safety if you are at least 2 metres (6 feet 6 inches) from the nearest line on which a train might approach. However if the speed limit on this line is no more than 100 mph, the distance can be reduced to 1.25 metres (4 feet).



Authorised walking route

An authorised walking route provides safe access to or from a place of work. They are often found near depots, stations and signal boxes and vary in construction – some are proper walkways, others are just rough paths. Details are given in a document called the Hazard Directory.

1.3 *Signals*

Most running lines have signals to control the trains. Generally, signals are operated from a signal box and have an identifying number displayed on them.



Signals are usually attached to posts alongside the track but can also be found on overhead gantries or on the ground. Modern signals tend to use coloured lights, but some lines still have semaphore signals.

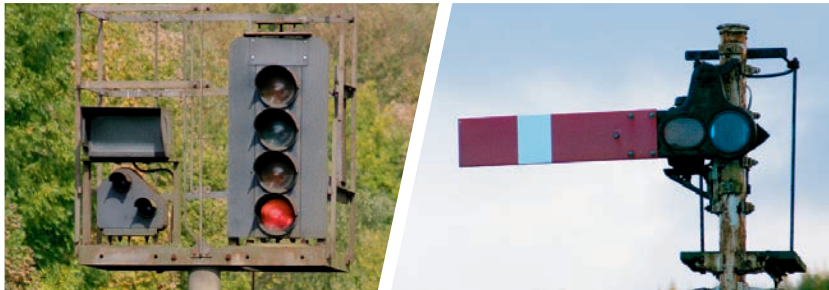


Each colour light signal has an 'aspect'. These are shown below.



A colour light signal is said to be 'at danger' if it's showing a red aspect.

A red semaphore signal is at danger if it's in the horizontal position.



Normally trains will stop at a danger signal but, in some situations, they can be authorised to pass them.

Some signals are automatic or semi-automatic and cannot always be put to danger by the Signaller. These are identified by the signs shown below.



An automatic signal may have a switch on the signal post which can be used to put it to danger, called a signal post replacement switch (SPRS). It is operated by a special key.



Be aware, some colour light signals don't have red lights so trains won't stop at them. This is also true of yellow semaphore signals. These are called distant signals.



1.4 Electrified lines

Some trains are powered by electricity from overhead cables or rails alongside the track. The electricity is controlled from an electrical control room.

Overhead line equipment (OLE)

Overhead line equipment, known as OLE, provides trains with 25,000 volts AC or, where trams or metro trains use the line, up to 750 volts DC. Each structure has a number displayed on it. In the picture below, the live parts have been highlighted in red.



You can only go on or near a line with OLE if your Sentinel card includes the qualification "PTS AC".



Always assume that the OLE, and anything in contact with it, is live and extremely dangerous. Make sure you, and anything you're carrying, don't go within 2.75 metres (9 feet) of live OLE or the electrification equipment on a train's roof, such as the pantograph.

Each OLE structure has a black cable connecting it to the running rail. This is known as a bond. There are also yellow bonds and red bonds. Red bonds are very dangerous if they become disconnected. Never touch them as there could be a dangerous voltage.

Immediately report to the Electrical Control Operator (ECO) any bond that you find disconnected, broken or defective. Include the colour of the bond, and the location of the bond.

In some situations, work can take place within 2.75 metres (9 feet) of live OLE, but only if a special Safe System of Work has been approved beforehand.

Conductor rails

A conductor rail, often called a third rail, provides trains with up to 750 volts DC. In the picture below, the live parts have been highlighted in red. On lines used by London Underground trains, there's another conductor rail in the four-foot. This is often called a fourth rail. Again, in this picture, the live rails have been highlighted in red.



You can only go on or near a line with conductor rails if your Sentinel card includes the qualification "PTS DC" (Which will be replaced by PTS DCCR from December 2014).



Always assume that conductor rails are live and extremely dangerous. Make sure you, and anything you're carrying, don't touch them or the electrification equipment on a train, such as the collector shoe.



A collector shoe

Work can only take place within 30cm (1 foot) of a live conductor rail if the approved insulated tools, shrouds or troughing, and PPE are used.

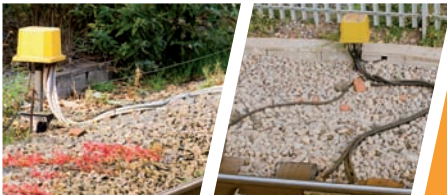
Take care with liquids – they will become live if they come into contact with a conductor rail. Keep clear of flood water.

Track circuits and axle counters

Track circuits and axle counters are a method of indicating to the Signaller in the signal box, where trains are in the area they control train movements on.

You must not place objects (e.g. measuring tapes or chains) across the rails, as it might operate the signaling equipment and change a signal aspect in front of a driver.

You must not allow any metal object near signaling equipment or within 300mm of an axle counter head, as this could interfere with its operation.



Axle counters

1.5 Telephones

There are many telephones on the railway. Most of them go straight through to the controlling signal box.

The most common are lineside phones (usually found near points) and signal post telephones (SPT). These are identified by the signs shown below.



A lineside phone

A signal post telephone

Other signs are also displayed on railway phones.



1.6 Limited clearances

On some parts of the railway, the space between the track and the nearest wall or structure is very narrow. These are areas of limited clearance. The sign shown below means there is no position of safety on this side of the railway for the length of the structure beyond it.



A refuge is a place where it is safe for you to stand when a train is passing. They can be built out over an embankment or cut into the wall of a viaduct, cutting or tunnel.



Examples of refuges

Tunnels can be very dangerous places and people are not allowed to work in most tunnels whilst trains are running. If you are allowed in, make sure you know where the nearest position of safety is – usually in a refuge.

You must also have a hand lamp or head lamp with you if you are entering a tunnel, working during the hours of darkness, or if the visibility is poor.

The sign shown below means there are no positions of safety or refuges on this side of the railway, but there are on the other side.



This sign speaks for itself – the area beyond it is too dangerous for people whilst trains are running. You can only go past it if you are carrying out emergency protection, or if trains have been stopped.

Some railway phones are in areas of limited clearance and can only be used in an emergency. They are identified by the signs shown below on the phone cabinet or at a signal.



2 *Are you fit for work?*

2.1 *Medical fitness*

Because of the possible dangers, it is important that everyone working on the railway is medically fit. As a result, you will be required to take periodic medical assessments and eye examinations.

It's your responsibility to keep your employer up-to-date about medication you're taking or any condition, which might affect your safety on the track. Make sure you work within any restrictions imposed on you for medical reasons. If you are asked to do something that you are not allowed to do, explain why you cannot.

It's important that you're able to see clearly when working on the railway. If you need glasses or contact lenses, make sure you wear them. If you are a contact lens wearer, always have a spare pair of glasses with you.

2.2 *Alcohol and drugs*

You must not come to work after taking illegal drugs, any medication which could affect your safety, or if you have recently had an alcoholic drink. Don't drink alcohol or take illegal drugs whilst on duty, or bring illegal drugs to work with you.

Report to your employer any medication you are taking that may affect your safety.

3

The Sentinel scheme

Sentinel is Network Rail's scheme for making sure that the people who work on or near the line are competent and medically fit. Full details about the Sentinel scheme are covered in NR/L2/OHS/050 Sentinel Scheme Rules; your sponsor will brief you on these and how they affect you.

Your sponsor

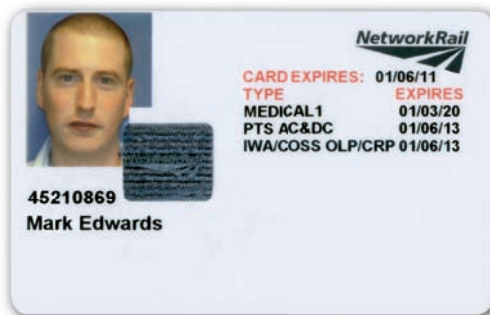
The company that pays you is normally your sponsor. You may have more than one though.

Without a sponsor your Sentinel card is invalid and you are not allowed to work on or near the line, or attend Sentinel recorded training courses.

Each time you have a new sponsor you will need to –

- pass an alcohol or drugs test or provide the proof you have passed one in the previous 12 months
- provide proof of your identity by use of passport or driving licence
- provide a copy of your medical certificate
- provide your Sentinel card, if you have one
- give details of any medical condition which might affect you while working on the railway
- give details of any medication you are taking or have taken recently.

If you have a Sentinel track safety card, you can only go on or near the line if you have your card with you and it is valid.



New Sentinel Card

Common Symbols found on Sentinel cards

- Green square means you are newly qualified in PTS
 - ▲ Red triangle means you must be accompanied when on the infrastructure
 - Blue circle means you have a colour vision defect; this prevents you holding some competencies
- (P) The letter (P) before a qualification indicates that it is probationary.

Your card has to include a photo which accurately shows how you look. If your appearance changes, perhaps because you start wearing glasses, you will need to provide a new photo. In any case, it must be updated after ten years.

Every time your qualifications change a new Sentinel card will be provided and you must then destroy your old one or if you have a new style card, your new qualifications will be updated automatically and you can keep your card.

If your Sentinel card is lost or stolen tell your sponsor immediately so it can be cancelled and replaced. In certain situations your card can be withdrawn or individual qualifications suspended. This might be because you have failed a drugs and alcohol test or your actions have contributed to an incident. This could also happen if you misuse your card – for example, by trying to use it as a credit card or travel pass.

To be valid –

- the PTS and medical must be in date
- you must have a sponsor and be working for them.

Always –

- comply with Network Rail's and your sponsor's alcohol and drugs policy
- wear the required Personal Protective Equipment
- work safely and comply with track safety rules
- only do things you are competent and, where necessary, qualified to do
- report any accidents, incidents or safety concerns straight away
- co-operate with anyone carrying out an investigation, spot-check or audit
- attend medicals, training and assessments when required
- tell your sponsor all your working hours.

Never –

- work excessive hours or back-to-back shifts
- try to use your Sentinel card as a credit card or travel pass.

If you don't comply with these rules your Sentinel card could be withdrawn.

Remember, no card no work.

4 *Going onto the railway*

4.1 *Controlling access*

The railway is a dangerous place, designed for trains rather than people. Keep off the railway unless you absolutely have to be there.

Even if you have a right to go onto the line, trespassers do not – they're a danger to themselves and the railway. So keep access gates closed and locked, even if your work will only take a few minutes. Make sure user-worked crossing gates are shut and barriers lowered. If you find a damaged boundary fence, try to secure it.

Report problems with fences, gates or barriers to Operations Control.

4.2 PPE and workwear

Your employer has to give you any PPE required for your work and show you how to use it. Keep it clean, check it for damage and report any defects. PPE can only protect you if you wear it properly – so make sure you do.

These are the minimum requirements for PPE when you're on or near the line or lineside –

- on an authorised walking route you have to wear at least a class 1 high visibility (HV) minivest
- the class number is usually printed on the label and depends on the amount of orange material and reflective tape
- if you have been recently qualified in PTS you will be inexperienced in the rules when you go on or near the line. You'll be required to wear a blue safety helmet until you and your sponsor agree that you are sufficiently experienced.



Blue safety helmet for inexperienced staff



Safety boots

A safety helmet

Safety vest

When on or near the line or lineside you will be required to wear approved safety footwear, a blue or white safety helmet and high visibility (HV) clothing on your upper body – in the form vest or a jacket as shown on this page. You will also be required to wear HV trousers or overtrousers as shown.

The wearing of these items is the minimum mandatory requirement.

Depending on your work or the site rules, you might also have to wear other items such as ear defenders, goggles, gloves or overalls.



Full PPE

Workwear is the normal clothing you wear to work. Comply with your employer's policy if it has one. Make sure you wear clothing suitable for the work, location and conditions. Full-length trousers are compulsory to help protect you from lineside vegetation and slips, trips or falls.

Sunglasses are allowed in bright conditions. But don't use tinted glasses if your job requires you to see colours. And take care with lenses which react to changes in light – they don't always react quickly if it suddenly gets dark.

4.3 *Using vehicles near the line*

Someone qualified as a COSS must be present and have given permission before a road vehicle is allowed to go in the area called on or near the line.

Road vehicles can be a serious danger to trains if they are used near the line without proper care. If you're the driver –

- don't allow any part of the vehicle to come within 2 metres (6 feet 6 inches) of any line on which a train might approach
- switch the hazard warning lights on and, in darkness or poor visibility, use dipped headlights
- only turn the vehicle at a suitable turning point and keep the back of the vehicle furthest from the line
- make sure all red lights are off when the vehicle is parked.

4.4 *Your safety – the basics*

Be prepared! Don't go on or near the line unless you're absolutely clear about the dangers at your location and how you're going to stay safe. Remember your safety is your responsibility. You need to know –

- the approved access point
- the speed limit and normal direction of trains on each line
- if there are any areas where people are not allowed to go whilst trains are running
- if there are other hazards at the location that might affect your safety.

This information can be found in the Sectional Appendix and Hazard Directory, or can be obtained from your manager or supervisor.

4.5 *Walking alone*

If there is no safer route, you can walk alone on or near the line to get to and from a place of work. But you must keep at least 20 metres from anyone else who is walking in the same direction, to avoid being distracted.



Use an authorised walking route or other proper pathway if there is one. Otherwise walk in the cess or, if necessary, in the four-foot. Wherever possible, face oncoming trains and try to stay in a position of safety.

Keep watching and listening for trains at all times – look up at least every 5 seconds or so. Never assume that you're safe just because a signal is at danger or a level crossing is open to road traffic.

Be aware, trains could approach in the wrong direction if they are operating on a single line, or the line is under possession to allow engineering work to take place.

At locations listed in the Sectional Appendix, a train operated warning system (TOWS) is provided. Use it if you know how. When the system is switched on, trackside sirens make a noise every few seconds to confirm that it's working properly – this is called a safe tone. Approaching trains are detected by the signaling system and a continuous warning is then given.



Example of a TOWS switch



Example of a TOWS warning siren

Don't allow yourself to be distracted. Switch your mobile phone off unless you need it on for safety reasons. If you have to use it, make sure you're in a position of safety and stand still until you have finished using the phone.

There is no position of safety in an area of limited clearance – so don't enter if a train is coming. These are dangerous places and should be avoided.

4.6 *When a train approaches*

When a train approaches you must go to the position of safety straight away and be there at least 10 seconds before the train passes.



The driver will sound the horn. Raise one arm above your head to show you have heard this warning. If you hear a series of short blasts on the horn, the train could be moving in the wrong direction.

Never assume you know which line the train is on, particularly if there are points nearby. Keep watching the train until it has passed you or you are certain that it isn't a danger to you. Before leaving the position of safety, make sure no other trains have approached without you noticing.

If a train approaches and for some reason you can't get to a position of safety, lie down but not in the four-foot. Gather loose clothing under you.

4.7 *Crossing the line*

If you need to cross the line, use a bridge, subway or level crossing if there is one. Otherwise, make sure there are no trains approaching and then go straight across without stepping on the rails or sleepers.



Take great care near points – they could move and trap your foot.

In sidings and engineering worksites, take great care when crossing the line near stationary trains or vehicles. They might move without warning or they could be hiding another train approaching on a line beyond them. Keep well clear and only cross if you're sure no other trains are coming.



On lines with conductor rails,
find a gap in the conductor rail.



Otherwise step over both the running rail and conductor rail together – never put your foot between them.



And, if possible, cross at a place where protective guarding has been provided.

5 *Walking in a group and working*

5.1 *The COSS*



If you're part of a group which is going to walk or work on or near the line, a COSS (Controller of Site Safety) will be appointed to set up *'a safe system of work'*.

The purpose of the safe system is to make sure nobody is put in danger by trains or electrification equipment. As well as the work itself, it will cover getting to and from the site and, if necessary, setting up safety equipment and blocking the line.

A COSS wears a blue armlet on their left arm, or badge on their upper body, with "COSS" written in white letters.

The COSS will stay with the group until the work is over and everyone is clear of the line. Of course they might be relieved by another COSS, in which case they'll tell you who the new COSS is.

5.2 *The person in charge*

Whilst the COSS deals with the safety of the workgroup, the person in charge makes sure that the work itself is carried out properly, within the relevant rules and to the required standards.

It's their job to confirm that a COSS is appointed and a suitable safe system has been set up before allowing work to start – this is particularly important if the work might affect the safety of trains.

In practice, if the person in charge has a COSS qualification, the two roles might be carried out by the same person.

5.3 *The Safe System of Work*

The Safe System of Work the COSS will set up may involve working in areas called –

- Safeguarded
- Site Warden Warning
- Lookout Warning
- Fenced
- Equipment Warning

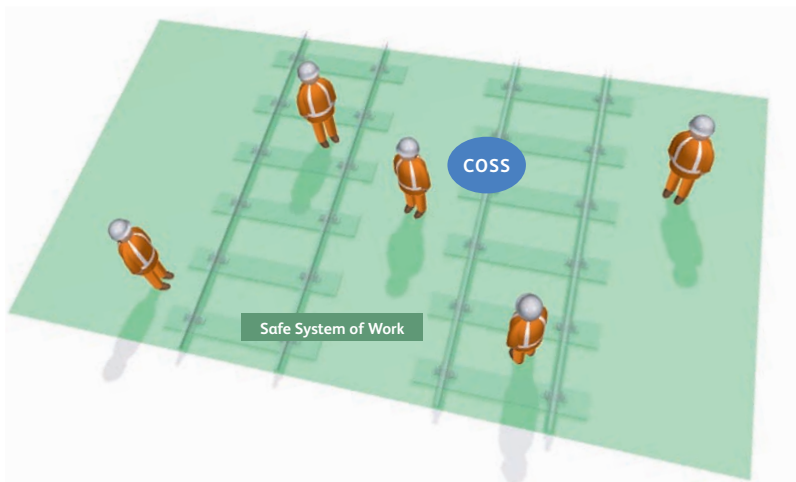
It is permissible to have train movements in a Safeguarded zone within a possession worksite. This applies to engineering trains and On Track Plant travelling no faster than walking pace.

If this is to happen you will be briefed by the COSS.

This arrangement can also apply to fenced zones and Site Warden warning zones, but only within a possession worksite.

1. Safeguarded Safe System of Work

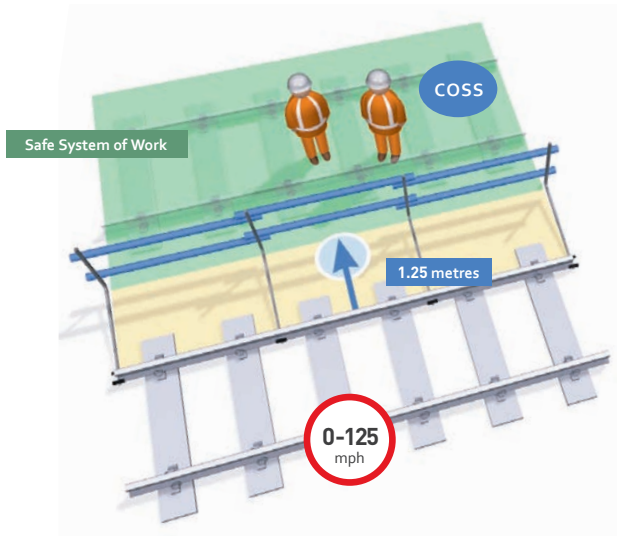
With a safeguarded Safe System of Work, all the lines at your site are blocked.



2. Fenced Safe System of Work

A temporary fence is put up between the site and nearest open line. There are three types – rigid safety barrier, plastic netting or barrier tape.

A rigid safety barrier can be positioned no less than 1.25 metres (4 feet) from the nearest open line.



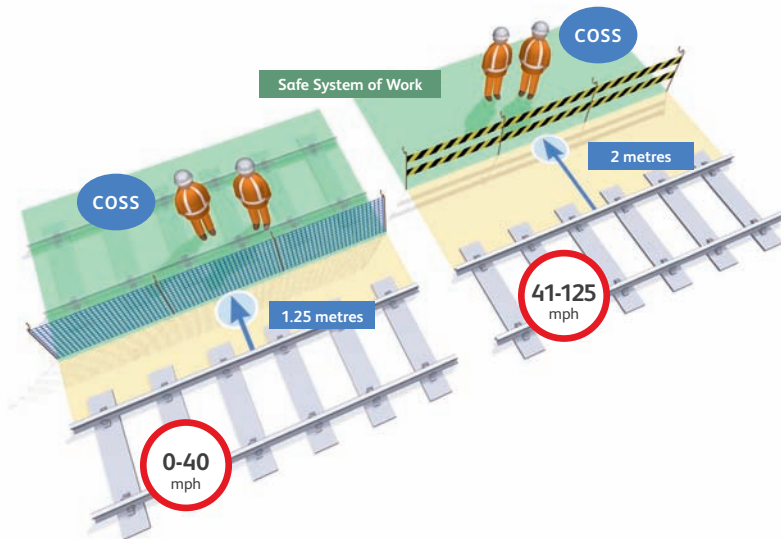
An example of a fenced Safe System of Work using a rigid fenced safety barrier.

You will be briefed by the COSS about the fenced zone. Stay on the safe side of the fence. Do not lean on or over the fence and do not lean objects against the fence.

If the COSS told you at the briefing there is a fence marking the safe working limit, you must –

- stay on the safe side of the fence
- not lean on or over the fence
- not lean objects against the fence.

A rigid or tensioned barrier can be positioned at no less than 1.25 metres (4 feet) from the nearest open line – if a fence of barricade tape or plastic netting is used – and trains can travel at no more than 40 mph. If more than 40 mph on a line the distance increases to 2 metres (6 feet 6 inches).

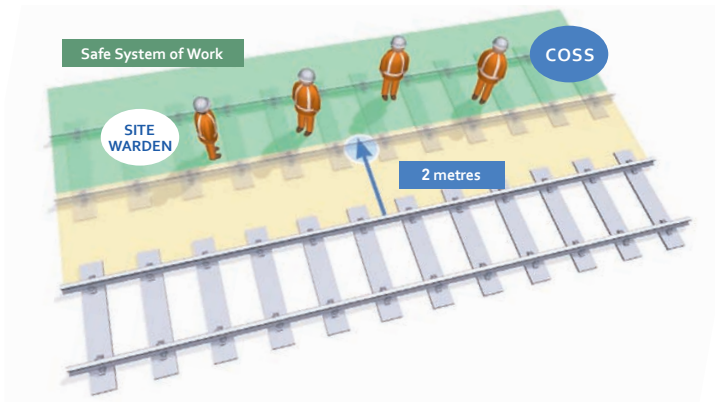


Examples of fenced Safe System of Work – (left) using plastic netting on a blocked line and (right) using barricade tape in the cress.

3- Safe System of Work using Site Warden Warning

With a Site Warden Warning area, a space is provided between the site and the nearest open line.

The space must be at least 2 metres (6 feet 6 inches) and the site warden is appointed if there are more than two people in the group.

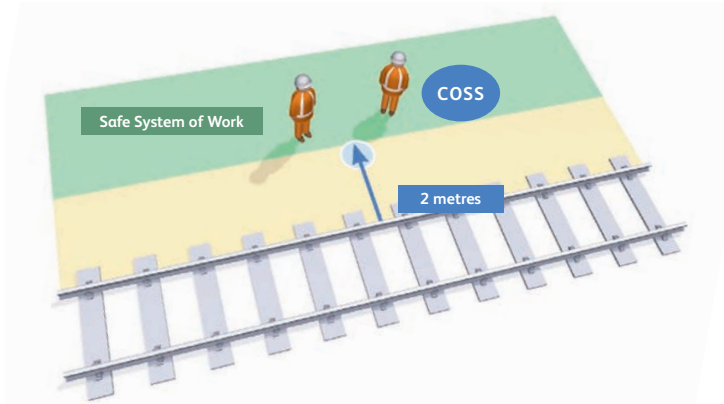


The Site Warden is provided so if someone strays outside the Site Warden Warning area, towards an open line, they will shout a warning 'get back!'



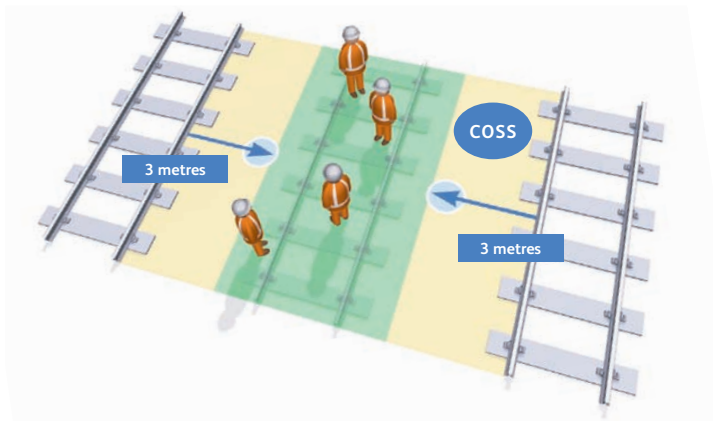
They wear a white armband on their left arm, or badge on their upper body, with "SITE WARDEN" written in blue letters.

If the group is you and the COSS, the appointment of a Site Warden is not required. The space must still be at least 2 metres (6 feet 6 inches) between the site and the nearest open line.



Example of COSS and PTS holder working 2 metres from any open line.

The space must be at least 3 metres (10 feet) if there are more than two people in the group, and there's no Site Warden.



Example of at least 3 metres between any open line and any member of a group.

4. Equipment Warning and lookout warning

In an Equipment Warning and lookout warning Safe System of Work you will be warned when a train is coming. The COSS will make sure enough prior warning is given for you to reach the position of safety, at least 10 seconds before the train passes.

There are four methods of equipment warning, listed in order of preference –

(a) Automatic track warning system (ATWS)

With an ATWS, approaching trains are detected by the signalling system or equipment attached to the running rails. The warning is given by trackside flashing lights and sirens and/or a personal warning device.

(b) Train operated warning system (TOWS)

With TOWS, approaching trains are detected by the signalling system. The warning is given by trackside sirens.



Example of a TOWS switch



Example of a TOWS warning siren

(c) Lookout operated warning system (LOWS)

With LOWS, approaching trains are detected by a lookout. The warning is given by trackside flashing lights and sirens and/or a personal warning device.



Examples of ATWS and LOWS warning equipment

(d) Pee Wee



With Pee Wee, approaching trains are detected by a lookout. The warning is given by a siren.

Lookout warning

Lookout warning is using unassisted lookouts, the warning is given by horn, whistle and touch if there is noise or the group are wearing ear protection.

A lookout may also use a cut off device on noisy equipment or plant.

The COSS will brief you on which method is to be used.



A warning given with a horn



With a whistle



By touch



Lookouts wear a white armlet on their left arm, or badge on their upper body, with "LOOK OUT" written in red letters.

5.4 *The briefing*

Before you walk to site or start work, the COSS will –

- show you their Sentinel card that will show they are qualified to perform COSS duties
- check that your Sentinel card, medical, PTS and any other relevant qualifications are in date

and tell you –

- the nature and location of the work
- the approved access point and route to site
- the limits of the site and how they are defined
- the lines at the site together with the maximum speed at which trains are allowed to travel and their direction
- which lines have been blocked and which remain open
- the best means of contacting the Signaller, the emergency services and, if necessary, the Electrical Control Operator
- information about site hazards, such as electrification equipment, buried services or poor cress conditions
- whether you will be working in an area that the line is blocked to trains or if the line remains open to trains.

For a Safeguarded, Fenced or Site Warden Warning Safe System of Work, the COSS will also tell you –

- the safe limits of work area and how it is defined
- where relevant, who the site warden(s) is and their method of warning.

For equipment and lookout warning working, the COSS will tell you –

- where the position of safety is
- the method of warning
- where relevant, who the site and touch lookouts are, and where they are positioned.

On electrified lines, you must assume that the OLE or conductor rails are live and dangerous, unless the COSS tells you that the electrification equipment has been isolated and –

- the limits within which it is safe to work
- whether any nearby electrification equipment is still live and dangerous and where it is
- whether non-electric trains or on-track plant could still approach on the isolated lines.

You will then be asked to confirm your understanding of the safety brief, the COSS will question you on the safe system and then ask you to sign a briefing form. Your Sentinel card number and role on site will also be recorded.

If you are unsure about any part of the briefing, ask the COSS to repeat it or explain it further.

6 *During the work*

6.1 *Keep to the safe system*

The COSS sets up a safe system to make sure you're not put in danger by trains or electrification equipment – but it will only work if you follow the COSS's instructions and comply with the track safety rules.

If you have any doubts about a safe system, stop work, make sure you're in a position of safety and then tell the COSS.



Only do things you're competent and, if necessary, qualified to do. Never do something which you think is unsafe or against the rules, even if you feel under pressure to get the job done.

Safe System of Work working

Always stay within the limits of the Safe System of Work.

If a fence has been put up, don't lean over it or place anything against it.

If a site warden has been appointed, don't distract them. If you think you might not hear their warning, tell the COSS.

If the site warden shouts a warning, make sure you're still within the Safe System of Work and move back into it if you're not. If you don't move back straight away, the site warden will give a series of short blasts on their whistle or horn.

Equipment and lookout warning working

When a warning is given that a train is approaching, stop work straight away and, if you are not already there, go to the position of safety.

If it's given by a lookout, raise one arm above your head to show you have heard their warning. If you don't move straight away, the lookout will give a series of short blasts on their whistle or horn.

Never distract a lookout. If you think you might not hear their warning, make sure you're in a position of safety and then tell the COSS.

After the train has passed, don't leave the position of safety until the COSS tells you it's safe to do so.

6.2 *Tools and materials*

If tools or materials are to be left on the ground whilst a train is passing, they must be at least 2 metres (6 feet 6 inches) from the line unless there's no chance of them being moved by the train's slipstream.



Tools and materials can be a hazard to people and trains – make sure they don't cause an obstruction. When the work has finished, remove them from the railway or secure them properly so vandals can't use them.

Be careful when you're using metal equipment. If it makes a connection between the two running rails it might put a signal to danger. It can also interfere with signaling and level crossing equipment. On electrified lines, you could get an electric shock.

6.3 *Changing the safe system*

Sometimes the COSS will need to change the safe system, perhaps because the site is moving or the weather has changed.

If this happens, the COSS will stop the work and make sure you're in a position of safety. Then they'll change the safe system and make sure you understand the new arrangements before allowing work to start again.

7 *Communicating clearly*

7.1 *A structured approach*

It's vital that all messages about safety are fully understood by both parties – this means communicating clearly and accurately. The rules in this section will help – make sure you apply them whenever you pass on important information, whether it's by phone, radio or face to face.



The phonetic alphabet is used to spell out difficult words and names, as well as making sure single letters are heard clearly.

For example, the town of Euxton would be spelt out as “*echo uniform x-ray tango oscar november*”.

The phonetic alphabet

A	<i>alpha</i>	J	<i>juliet</i>	S	<i>sierra</i>
B	<i>bravo</i>	K	<i>kilo</i>	T	<i>tango</i>
C	<i>charlie</i>	L	<i>lima</i>	U	<i>uniform</i>
D	<i>delta</i>	M	<i>mike</i>	V	<i>victor</i>
E	<i>echo</i>	N	<i>november</i>	W	<i>whisky</i>
F	<i>foxtrot</i>	O	<i>oscar</i>	X	<i>x-ray</i>
G	<i>golf</i>	P	<i>papa</i>	Y	<i>yankee</i>
H	<i>hotel</i>	Q	<i>quebec</i>	Z	<i>zulu</i>
I	<i>india</i>	R	<i>romeo</i>		

Numbers can also be a problem, so split them up and say them one at a time. For example, 205 would be spoken as "two zero five". "Zero" is the correct way of saying the number 0.

There are also several standard phrases which you'll need to use –

"This is an emergency call"	In an emergency, this is the first thing you must say when your phone or radio call is answered. It tells the other person that they will need to take action straight away to prevent death, injury or damage.
-----------------------------	---

"Repeat back"	Repeat all of the message back to me.
---------------	---------------------------------------

"Correction"	I have made a mistake and will now correct the word or phrase just said.
--------------	--

You'll need to use the following phrases when communicating with radios, which only allow one person at a time to speak –

"Over"	I have completed my message and am expecting a reply.
--------	---

"Out"	I have completed my message and am not expecting a reply.
-------	---

One of the people involved in the conversation will have 'lead responsibility'. This person will help the other to pass on their information clearly and accurately and understand what's required. For example –

Electrical Control Operator (ECO)	<i>has lead responsibility when talking to</i>	anyone
Signaller		anyone except an ECO
COSS		Lookout/Site Warden and anyone in their group

7.2 **Make it clear**

If you are giving a safety message make sure you are speaking to the right person. Both people must say who they are, their role and where they are speaking from. For example –

“This is Derek Pilling – I’m a COSS for Network Rail, calling from mike papa one four zero signal.”

It's important to speak clearly and avoid lots of ums and errs. If you don't understand something, perhaps because the other person has a broad accent, ask them to repeat it.

Phone lines and radio links can break up. You can help by speaking slightly slower than you would normally. Don't shout – the sound will just distort.



Make sure the microphone is in front of your mouth but not too close.



Try to shield the mouthpiece if it's windy.

If you're using a radio, press the 'transmit' button fully before you speak and don't release it until you've finished. With some phones, you have to push a 'press to talk' button.

Before allowing the conversation to end and any action to be taken, the person with lead responsibility must make sure that any errors have been corrected and both people know what's going to happen next.

If you are receiving the message repeat it back to confirm you have understood it properly. Ask for the other person's phone or radio call number.

7.3 *Emergency calls*

When lives are in danger, time is of the essence, pressure is high and accuracy is everything. Here's how a typical emergency call might go.

Start by getting the attention of the person on the other end by saying –

“This is an emergency call.”

Make sure you're speaking to the right person, usually the Signaller or Electrical Control Operator –

“Is that the Signaller?”

Tell them who you are, what you do and where you are –

“This is Mike Middleton - I'm a track chargeman for Network Rail, calling from Shapton East junction.”

Describe the problem –

“I've found a member of the public lying in the four-foot of the Down Goods line, 300 yards beyond sierra hotel one two zero signal. They're badly injured and I can't move them.”

Tell them what action needs to be taken –

“I need you to stop trains on the Down Goods line and arrange for an ambulance to attend.”

Make sure the other person repeats back the information – it's vital they fully understand it. The Signaller or ECO will tell you what they've done, what's going to happen next and what they want you to do. Give them your phone or radio call number so they can contact you.

As someone who works for the railway, there are situations where you might have to take action to prevent death, injury or damage.

But whatever you do, don't put yourself in danger.

8

*Emergency
situations*

8.1 *Danger to trains*

An emergency call must be made to the Signaller straight away if you see or are told about something which might be a danger to trains.

On a moving train, possible problems include –

- a door not closed properly
- a load which is not secure
- a fire or hot axle box
- no lit headlight or tail lamp
- the driver or guard showing a red flag or red light
- the driver repeating a series of long blasts on the horn
- a train's headlights flashing.

Other problems include –

- a fault with the track
- a colour light signal not showing an aspect
- a fire, flood or obstruction
- a large animal within the railway boundary.

In any of these situations, you might also need to stop the trains and call the emergency services.

The Signaller does not need to be told if there's an obstruction that you can remove safely.

8.2 *Stopping a train*

In an emergency you can stop a train by giving a hand danger signal. Obviously this must be clearly visible to the driver.

In daylight, hold out a red flag or raise both arms above your head.



In darkness or poor visibility, shine a red light or wave any light vigorously.

If possible, try not to give the hand signal in such a way that other approaching trains might stop.

8.3 *Protecting the line*

If a line becomes unsafe, the driver of any approaching train must be alerted to the danger ahead – this is known as protecting the line.

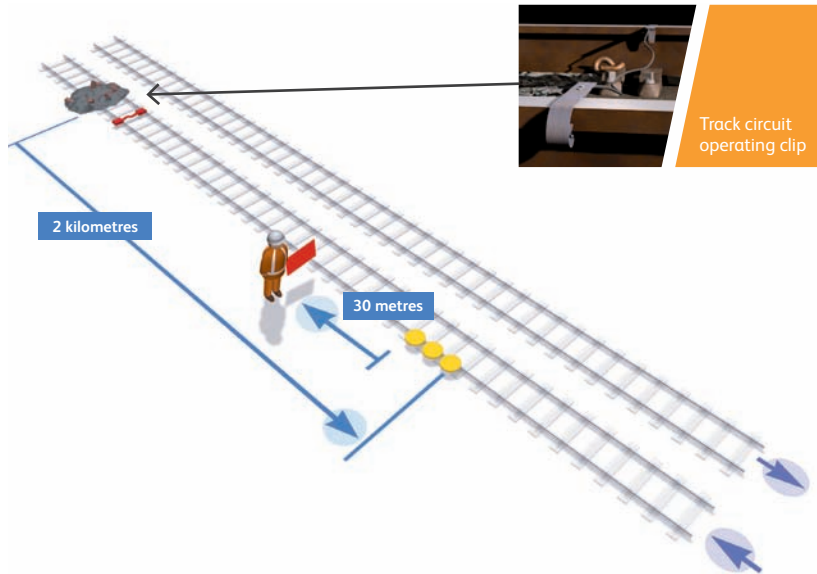
If you have one, your first step is to connect a track circuit operating clip between the two running rails. On many lines this will turn the nearest signal on the approach to danger. If there's a conductor rail, attach the first clip to the running rail furthest from the conductor rail first.

Where there are 4 rail DC areas you are not able to use a track circuit operating clip.



Then walk towards approaching trains for 2 kilometres (1¼ miles) and place three detonators on the line 20 metres (22 yards) apart.





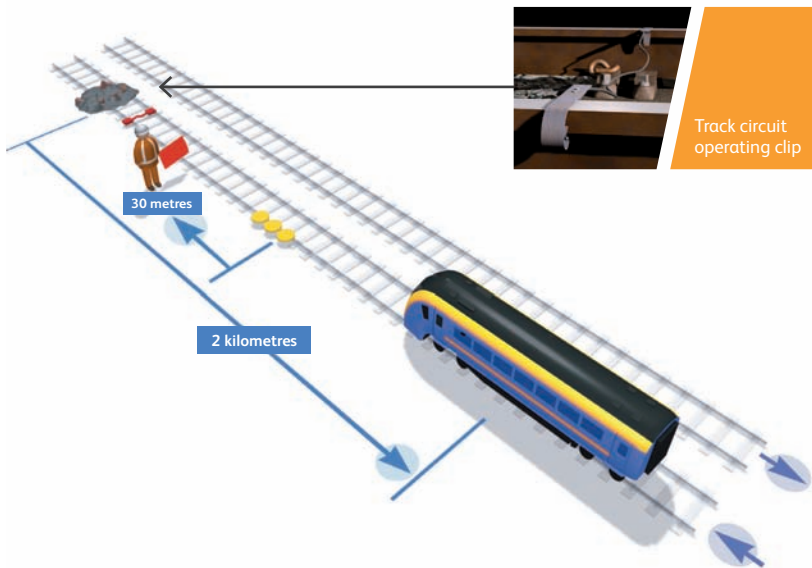
A detonator is a small yellow disc which is placed on top of the rail. It explodes when a train passes over it to alert the driver that the line ahead is blocked and to apply the emergency brake.

On lines with a conductor rail, place the detonators on the running rail furthest from the conductor rail.

Be aware, detonators must be handled carefully. When you've placed them on the rail, move at least 30 metres (32 yards) away. Make sure nobody else goes near them.

There are a number of things which you might encounter as you walk the 2 kilometres (1¼ miles).

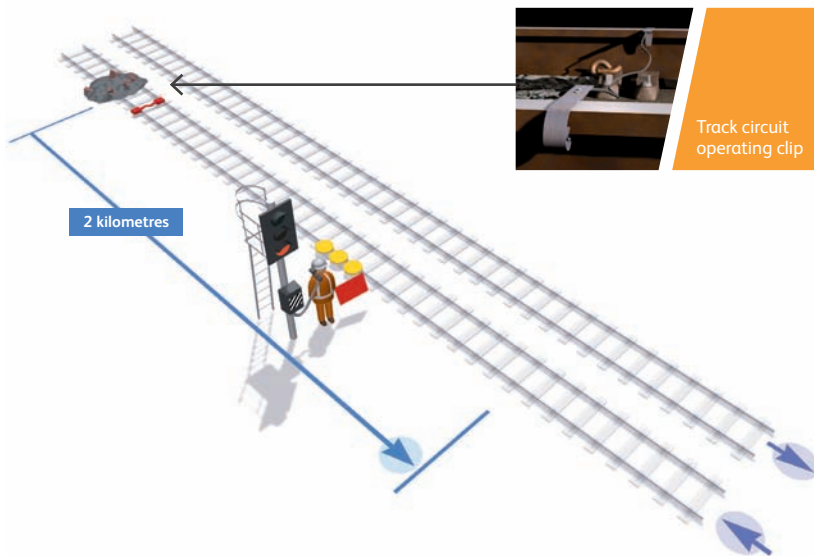
If you see a train approaching, place three detonators on the line straight away and display a hand danger signal. Please be careful not to put yourself in danger and stand at least 30 metres (32 yards) from the detonators.



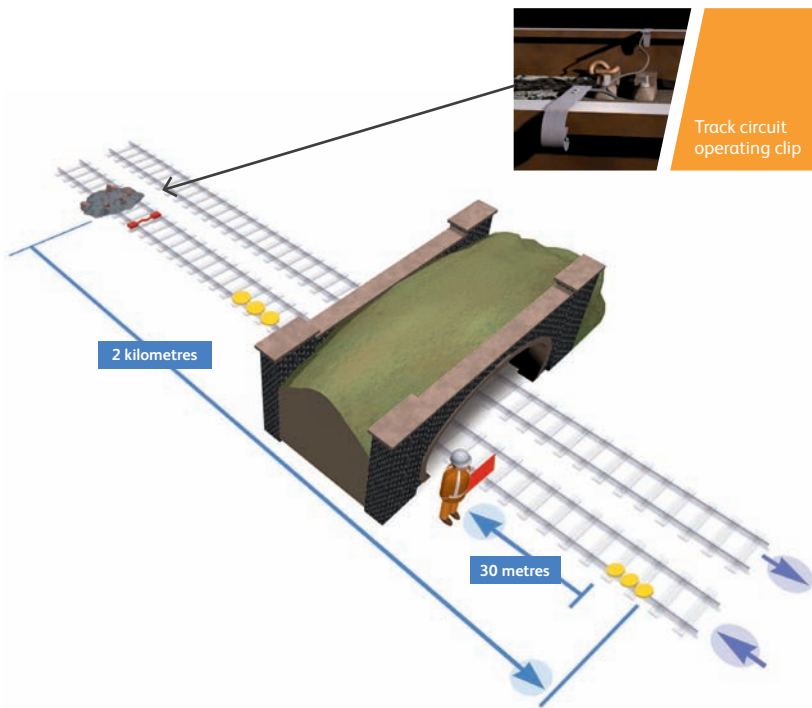
If you reach a signal box or railway phone and you've been unable to report the emergency, place three detonators on the line and contact the Signaller.

If the Signaller tells you that the line is now protected by signals, you do not need to continue to 2 kilometres (1¼ miles).

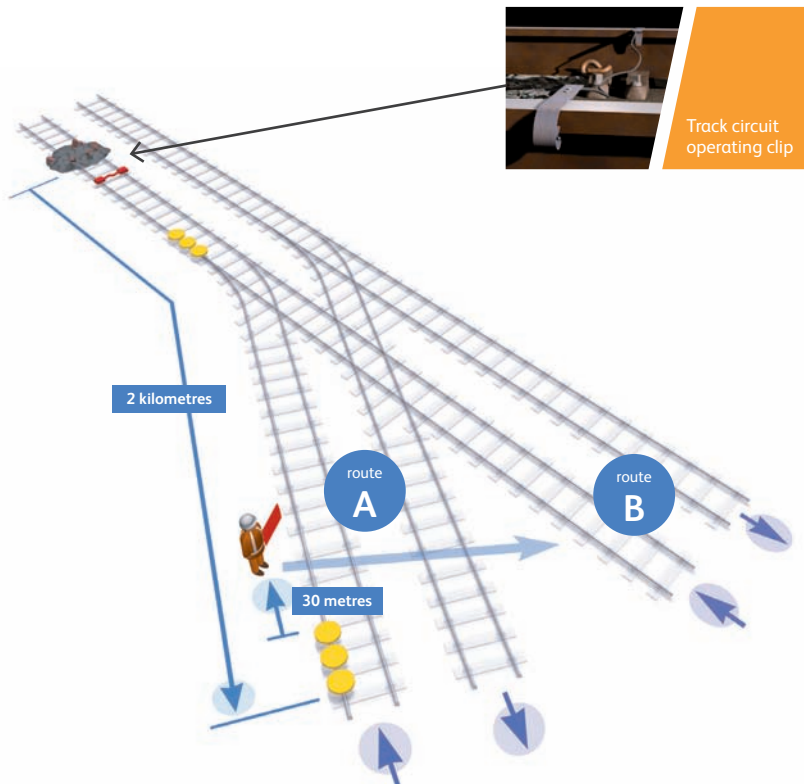
If the first signal you reach has a signal post replacement switch and you have a key, turn the signal to danger, place three detonators on the line and call the Signaller.



If you reach a tunnel, place three detonators on the line at the tunnel entrance. Then, if the 2 kilometres (1¼ miles) distance is inside the tunnel, walk to the other end and place three more detonators on the line.



If you reach a junction and trains could approach from more than one direction, place three detonators on the line before the points. Then decide from which direction the next train is most likely to approach. Walk in that direction and place three detonators on the line 2 kilometres (1¼ miles) from the obstruction. After that, go back and place detonators on the other lines.



In this example the person placing the detonators thought the next train was most likely to approach on route A.

After placing the detonators, display a hand danger signal to any approaching train but make sure you've got your back to the detonators to avoid the blast. Stand at least 30 metres from the detonators.

Remain in position until someone else takes over from you, or the line is protected in some other way.

When your protection is no longer needed, remove all the detonators and any track circuit operating clips. Then tell the Signaller. Give the track circuit operating clips to your supervisor – they can only be used once.

If you used a signal post replacement switch to turn a signal to danger, ask the Signaller for permission before putting it back to automatic.

8.4 Incidents on electrified lines

An emergency call must be made to the Electrical Control Operator (ECO) straight away if you see or are told about something, which requires the electricity to be switched off.

Possible problems include –

- a derailment
- a person in contact with electrification equipment
- a fire on a train, vehicle or lineside
- damage to the OLE or conductor rail.

Explain why the electricity needs to be switched off. On lines with OLE, give the number of the nearest OLE structure. For conductor rail areas, give the nearest mileage post, nearest hookswitch or track isolating switch number, nearest signal post number, or nearest bridge number.

Emergency rescue on lines with OLE

Do not approach a casualty whilst the OLE is live if –



- they are in contact with the OLE
- they are within 2.75 metres (9 feet) of the OLE
- any part of them is above the OLE.

You must wait until the ECO has arranged an 'emergency isolation' and assured you that the electricity has been switched off. Even then, there may still be a residual voltage so cover your hands with something dry and non-conductive before touching the person – dry clothing for example.

If it's not possible to switch the electricity off immediately, you can attempt a rescue but only if the casualty is at least 2.75 metres (9 feet) from any live OLE, or anything in contact with it, and neither of you move within this distance during the rescue.

Emergency rescue on lines with conductor rails



If someone is in contact with a live conductor rail, they should not be approached until the ECO has assured you that the electricity has been switched off – an emergency isolation.

If it's not possible to switch the electricity off immediately, you can attempt a rescue but only if you cover your hands with, and stand on, something dry and non-conductive before touching the person. Never use anything metallic or wet.

9 *Reporting your concerns*

If there's a safety issue, don't keep it to yourself.

Take action straight away if you see someone acting in a way which is a danger to themselves or the railway. If you can speak to the person and get them to stop, do so. Otherwise, report them to your supervisor or the Signaller – whichever is quickest.

There are two ways to report other concerns. Your first step should be to tell your supervisor or sponsor. If this isn't possible, you can contact CIRAS – the railway's confidential reporting service – Freephone **0800 4 101 101** Text **07507 285887** (standard text rates apply) www.ciras.org.uk.

Whatever the problem, if safety is at risk, don't ignore it.

The industry has a procedure called 'worksafe' – this gives you the right to refuse to work until any safety concern you have is properly dealt with. It's there for your protection so, if necessary, don't be afraid to use it.



Network Rail
Kings Place
90 York Way
London
N1 9AG
National Helpline: 08457 11 41 41
Switchboard: 020 7557 8000