

Investigators' Handbook

Part 1 – Introduction



Part 1 – Introduction to the handbook

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Introduction

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Aims of this handbook

This **Investigator's Handbook** is intended to aid investigators – and DCPs – in understanding the investigation process within Network Rail. It complements the training that investigators will have received.

Investigations conducted without a framework or structure may result in important facts and information being missed, or the investigation may become unnecessarily long and cumbersome.

It is important to approach each investigation with an open mind and to always be prepared to recheck information or evidence that may already have been obtained, to be sure nothing is missed.

Pre-conceived ideas about what and who was involved may lead to the real causes being missed.

This handbook aims to provide investigators with guidance on undertaking an investigation and the tools and techniques available in order to help:

- establish the causes;
- propose the remedial actions;
- complete the investigation report.

What will make a good investigation?

Only by carrying out investigations that identify **all** the causes – and the deeper issues – can we learn from accidents and incidents and prevent them recurring.

Simply dealing with the immediate causes of accidents or incidents will only provide a short-term fix because this will not address the underlying causes and this will mean that further accidents and incidents are likely to occur, possibly with more serious consequences.

The objective of an investigation is to establish not only how the accident/incident happened but, more importantly, what allowed it to happen. It is essential that an investigation identifies all the immediate and underlying causes and the remedial action taken to address these.

Investigations should be conducted with accident prevention in mind, not placing blame or allocating liability. Apportioning blame – or liability – before the investigation has been held is likely to be counterproductive because those involved are more likely to become defensive and uncooperative.

Once an investigation has been completed the actions of the individuals involved need to be considered. Considering whether an individual's actions were appropriate or not is an essential part of the investigation, as is the need to seek to understand why an individual has taken inappropriate action, or why human failure occurred.

Accidents and incidents may be the outcome of human error or the deliberate acts (i.e. violations) of individuals.

Investigations that conclude that an individual's error was the only cause are rarely acceptable. Underpinning the 'error' there are likely be a number of underlying causes that created an environment which made the error inevitable, e.g. inadequate training and supervision, or poor attitude to health and safety.

The techniques contained within this handbook (and the Accident Investigation Learning Programme) will help to properly understand the nature of any human failure and the causal factors that led to it.

Disciplinary process

The disciplinary process may impinge upon the accident/incident investigation process but this handbook, and the investigation processes it covers, does not address the disciplinary process save to say that mention of disciplinary action being taken should not be included in any investigation report.

The report should be confined to identifying the causes and the underlying factors.

Liability

Similarly, the determination of liability does not form part of this handbook and investigation process.

Standards

The following is a summary of the Railway Group and Network Rail company standards and guidance notes that:

- a) are referred to in this handbook, or
- b) otherwise relate to the investigation of accidents and incidents.

No.	Title
<i>Railway Group standards</i>	
GO/RT3118	<i>Incident Response Planning and Management</i>
GO/RT3119	<i>Accident and Incident Investigation</i>
GO/GN3519	<i>Guidance on Accident and Incident Investigation</i>
GE/RT8047	<i>Reporting of Safety Related Information</i>
GE/RT8250	<i>Reporting of High Risk Defects</i>
<i>Network Rail standards</i>	
NR/L2/INV/002	<i>Accident and Incident Reporting and Investigation</i>
NR/L3/INV/0201	<i>Deciding the lead organisation and level of investigation</i>
NR/L3/INV/0202	<i>External agency investigations</i>
NR/L3/INV/0205	<i>Network Rail led investigations</i>
NR/L3/INV/0206	<i>Investigations led by other Railway Group members</i>
NR/L3/INV/0207	<i>Investigation remit and report writing</i>

Other useful publications

See the 'Publications, DVDs, etc.' sub-section of Part 8 of this handbook for details of other useful publications related to accident investigation.

Definitions

The definitions shown in [NR/L2/INV/002](#) apply, where appropriate, throughout this handbook and are included in Appendix A.

The immediate post-incident investigation process

This handbook does not address, in any detail, the immediate post-incident investigation processes.

The immediate post-incident investigation process will, however, have a bearing on the investigation processes covered by this handbook, e.g. evidence collected and details of witnesses, damage sustained, results of tests, etc.

Where appropriate, this is explained within the handbook.

The following is a summary of the Railway Group and Network Rail company standards and guidance notes that apply to post-incident investigation process.

No.	Title
<i>Railway Group standards</i>	
GO/RT3118	<i>Incident Response Planning & Management</i>
GO/GN3518	<i>Guidance on Incident Response Planning & Management</i>
<i>Network Rail standards</i>	
NR/L2/OCS/250	<i>Network Rail National Emergency Plan</i>
NR/CS/OPS/250	<i>Accord for Rail Incident Investigation between RAIB and Network Rail</i>

Format of this handbook

This handbook comprises nine parts, each comprising a number of sections. See the separate 'Contents' section for details of what's included in each part/section.

Yellow text boxes are provided throughout the handbook and are intended to highlight specific or noteworthy guidance.

Cross-references

Where appropriate, and to avoid unnecessary repetition, cross-references are provided where possible to the parts/sections/sub-sections of the handbook where further guidance/information can be found. These will be identified as follows:

Cross-reference to other parts, or sections/sub-sections within other parts of the handbook.	Normal text with the part, section or sub-section indicated in quotes, e.g. "see 'Part 4' of this handbook".
Cross-reference to another section or sub-section within the same part of the handbook.	Blue text indicating an automatic reference is available (e.g. "see the Error! Reference source not found. section of this Part 2A of the handbook"). Click on the blue text to go to the referenced section/sub-section.

Links to standards/websites

Similarly, and where appropriate, links are also provided to:

- a) the pages on Connect where further information is available;
- b) websites providing access to useful tools and information;
- c) Network Rail standards referred to within this handbook.

These will also be identified by blue, underlined text (e.g. [Templates](#)).

Accessing a cross-referenced or linked document

Place the cursor over the cross-reference text of link. Depending on how you've set your preferences on your desktop/laptop, to go to the part/section/sub-section shown, or to go to the linked document you'll either have to:

- a) depress the CTRL key on the keyboard, then use the left mouse click, or
- b) click once on the left mouse.

Changes to the handbook

If you wish to propose changes, e.g. to include an item of best practice that would benefit other investigators or DCPs, please contact:

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Appendix A – Definitions

Term	Definition
Accident	An unwanted or unintended sudden event or a specific chain of such events which have harmful consequences, e.g. accidents include the following: collisions, derailments, vehicles struck at level-crossings, persons struck by trains, fires and others.
Assault	Any event in which a person is: a) physically assaulted; b) subjected to verbal abuse or has been threatened with violence, whether or not there is physical injury. All assaults should be dealt with in the same manner as an accident.
Close call	A close call is an incident that has occurred due to an unsafe condition or act that in other circumstances could have resulted in personal injury or damage to plant, machinery, infrastructure or the environment. It should not be confused with a 'near miss' (see definition below).
Contractor	A person undertaking work under contract for Network Rail; this includes a person sub-contracted to undertake work for Network Rail. This also includes a self-employed person and staff of agencies used by Network Rail or its contractors.
Control office	This includes the control office that: a) controls the day-to-day running of the railway (i.e. Route Operations Controls); or b) is relevant to a particular activity (e.g. Infrastructure Group Control).
DCP	A designated competent person (DCP) is the person identified by the lead organisation as responsible for supervising/managing the investigation process.
Event	Where this term is used, it means occurrences resulting in an accident or incident.

Term	Definition
Enforcement action	For the purposes of this specification, this means Improvement Notices (except Improvement Notices served under the Fire Precautions Act 1971), Prohibition Notices and prosecutions by the Health and Safety Executive (HSE), Environment Agency or other enforcing authority.
Fatality	Any injury or condition that results in the death of a person and, in the case of an employee, includes those cases where death occurs within a year of the accident where the injury or condition was suffered. Death from natural causes is not reportable unless it can be shown there is a good reason to suppose the death arose out of or in connection with work.
Formal investigation	A formally structured investigation of an accident or incident led by Network Rail or a railway undertaking and undertaken in accordance with the processes mandated within the Reporting and Investigation Manual.
HSMS	Network Rail's Health and Safety Management System.
Incident	An unplanned, uncontrolled event that under different circumstances may have resulted in an accident (also referred to as a 'near miss' or 'close call').

Term	Definition
Infrastructure manager	<p>A person who:</p> <ul style="list-style-type: none"> a) in relation to infrastructure other than a station, is responsible for developing and maintaining that infrastructure or, in relation to a station, the person who is responsible for managing and operating that station, except that it shall not include any person solely on the basis that he carries out the construction of that infrastructure or station or its maintenance, repair or alteration; and b) manages and uses that infrastructure or station, or permits it to be used, for the operation of a vehicle. <p><i>This definition is obtained from The Railways and Other Guided Transport Systems (Safety) Regulations 2006; the regulations define a “vehicle” as being “a mobile traction unit”.</i></p>
Judicial and HSE inquiries	An inquiry conducted by a person appointed by a Secretary of State, or by the Health and Safety Executive (HSE).
Lead investigator	A competent person appointed to lead and manage the investigation.
Lead organisation	Network Rail or the railway undertaking responsible for managing the investigation process in accordance with the criteria detailed in the Reporting and Investigation Manual.

Term	Definition
Line manager or project manager	<p>This includes, for the purposes of this specification:</p> <p>a) Persons with the competence and responsibility within their function for:</p> <ul style="list-style-type: none">the safe operation of the railway and organisation of train services;briefing the reporting or investigation process to employees;managing or supporting the reporting or investigation process. <p>b) Persons responsible for managing, administering and delivering contracts either for major or minor works schemes, e.g. project managers.</p>
Local action	A response directed at line management due to the application of an existing control measure not being followed (e.g. not following a rule, regulation or process).
Local investigation	An investigation of an accident or incident, for which a formal investigation is not required, by Network Rail or railway undertaking, and held in accordance with the requirements and criteria contained within the Reporting and Investigation Manual.
Major injury	An injury defined in Schedule 1 of RIDDOR 1995 and guidance thereto.

Term	Definition
Member of the public	<p>This definition applies to persons who are not:</p> <ul style="list-style-type: none">• employees of Network Rail and its contractors whilst on duty;• the employees of other Railway Group members and their contractors whilst on duty. <p>The definition includes:</p> <ol style="list-style-type: none">a) railway neighbours, i.e. persons who may be affected by Network Rail activities, including users of level crossings;b) persons on business or with legitimate reasons for being on Network Rail property (e.g. HM Railway Inspectors and others with statutory powers to enter onto Network Rail property);c) trespassers.
National Recommendations Review Panel (NRRP)	<p>A Network Rail panel which reviews reports and recommendations arising from:</p> <ul style="list-style-type: none">• public and HSE inquiries;• RAIB investigations;• Network Rail-led formal investigations;• local investigations containing recommendations with national implications.
Near miss	<p>A 'near miss' is an incident involving a train or rail mounted plant that has occurred due to an unsafe condition or act and which in other circumstances could have resulted in personal injury.</p>

Term	Definition
Network Rail Managed Infrastructure (NRMl)	<p>Network Rail Managed Infrastructure is the infrastructure that falls within the geographic boundaries of Network Rail's operational railway, including the permanent way and land within the lineside fence, and plant used for signalling or exclusively for supplying electricity for traction purposes to Network Rail's operational railway. It does not include stations (whether or not these are managed by Network Rail), nor does it include depots, yards or sidings owned by, or leased to, other parties.</p> <p>However, it does include the permanent way at stations and plant within these locations used for signalling Network Rail's operational railway or exclusively for supplying electricity for operational purposes to the operational railway.</p> <p>Structures such as tunnels, bridges, viaducts, underpasses, etc. are deemed to form part of NRMl only in relation to their potential to transfer risk onto, or from, the operational railway.</p>
Occupational ill-health	<p>Any case of ill-health that is suspected or known to have resulted from the affected person's work environment or work activity, other than ill-health caused by personal accident or assault.</p> <p><i>This term only applies to cases of occupational ill-health diagnosed or certified by a medical practitioner and includes cases of reportable disease.</i></p>
Personal accident	<p>An uncontrolled, unplanned event that results, or could in similar circumstances result, in an individual being injured or shocked. This includes:</p> <ul style="list-style-type: none"> a) assaults, whether or not physical harm was caused; b) ill-health that is attributable to a single event whilst an employee is at work and includes inhaling, swallowing or otherwise absorbing any substance, or suffering from lack of oxygen, except where a reportable disease is involved.

Term	Definition
RAIB investigation	An investigation conducted by the Rail Accident Investigation Branch (RAIB) in accordance with the Railway (Accident Investigation and Reporting) Regulations (RAIR) 2005.
Railway Group	<p>Network Rail and other certificated transport operators operating on NRMI.</p> <p>Details of 'other certificated transport operators', i.e. those with a safety certificate, can be found on the Network Rail Portal. Go to the 'Applications' tab and select 'National' and 'Safety' and under 'References' click on 'ROGs – Safety Certificates/Authorisations'.</p>
Railway undertaking	A transport undertaking, as defined in the Railways and other Guided Transport Systems (Safety) Regulations 2006, whose safety certification covers the operation of trains on NRMI.
Recommendation	A proposal made following an inquiry or investigation to change an existing control measure; or to define a new control measure to eliminate or mitigate a risk derived from the cause(s) or contributor(s) of an event, as described in an inquiry or investigation report.
Recommendations Review Panel (RRP)	<p>A Network Rail panel formed at a local level which:</p> <ul style="list-style-type: none"> reviews reports and recommendations arising from local investigations; reviews recommendations referred to it by NRRP; may refer to NRRP recommendations with national implications or application.
Reportable disease	Any case of a disease listed in Schedule 3 of RIDDOR 1995.
Reporting and Investigation Manual	A manual produced by Network Rail, comprising the company's processes and supporting guidance for accident and incident reporting and investigation.

Term	Definition
RIDDOR 1995	The Reporting of Injuries Diseases and Dangerous Occurrences Regulations 1995.
ROGS 2006	Railways and Other Guided Transport Systems (Safety) Regulations 2006.
Safety Management Information System (SMIS)	The Safety Management Information System, owned by the Rail Safety and Standards Board (RSSB) and used by Railway Group members for the retention of data applicable to safety events.
SMIS input point	The part of the organisation or function responsible for reporting events to SMIS.

Why investigate?

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There are a number of reasons why we investigate accidents and incidents.

Moral

Investigating accidents and incidents demonstrates – to employees, customers, suppliers, stakeholders, regulators and the general public – a commitment to improving health and safety.

A good investigation will provide general lessons to be learned, which can usually be applied throughout the organisation.

This may have a positive effect on staff morale and public perception.

Economic/Financial

Tackling the causes of accidents and incidents should not be seen as an unnecessary overhead. Many organisations find that investment in improving workplace standards and safety provides a financial benefit through, for example:

- improved productivity and efficiency;
- reduced staff absence;
- reduced staff turnover;
- improved quality of work.

A combination of reducing accident costs and prevention costs can lead to dramatic savings in the company's bottom line.

But you can't make things better if you do not know what went wrong.

Organisations with high standards of health and safety are often the most successful – and this is irrespective of their size or industry. These organisations view the losses arising from accidents and incidents in just the same way as any other type of loss and recognise that they need to be controlled. They apply effective management to health and safety, which they integrate into the overall management agenda.

In order to work safely, the things needed (i.e. trained and competent staff, proper equipment, robust procedures, etc.) are the same things that are needed for good business performance. There should be no conflict between safety and performance; if there is, something is wrong.

The positive business benefits are wider than just the financial costs. Lost service or reduced time means poorer service quality. This can lead to customer dissatisfaction and loss of future business. The reputation of the business will also be improved. See the section on [Cost of accidents](#) section in this Part 1 of the handbook.

Civil Procedure Rules 1998

These require an employer to make full disclosure of the circumstances of a workplace accident to an injured party who is considering legal action.

The ability to respond in an effective manner to compensation claims for injury or loss often requires the detailed collection of perishable evidence in the immediate aftermath of the accident/incident. Failure to carry out a prompt and effective investigation may therefore compromise the claims handling process.

An incomplete or inadequate investigation of the accident may mean that only limited information can be provided, and this is likely to make it difficult for an organisation to counter a claim by, for example, the injured party as to why the accident happened.

Equally, it may be hard for the employer to convince a court that the company had a positive attitude to health and safety.

Legal

Making sure the organisation is operating within the law, i.e. identifying compliance with requirements in statutes and regulations, and complying with industry and company standards, is essential.

This includes complying with requirements relating to accident reporting and investigation. These requirements fall into two categories:

- Legislation, i.e. Acts of Parliament and any subordinate regulations, which are imposed on all businesses in the UK;
- Industry requirements, i.e. Railway Group and company standards, which affect members of the rail industry.

Legislation

Health & Safety at Work Act, etc., 1974 (HASWA)	This does not contain an actual requirement for businesses to investigate accidents, but such a need is implied. How else can an organisation comply with the general requirements of HASWA (e.g. assessing risks), providing information to employees, etc. and its subordinate legislation (e.g. RIDDOR)?
Management of Health & Safety at Work Regulations 1999 (MHSW)	<p>Regulation 5(1) requires that: <i>“Every employer shall make and give effect to such arrangements as are appropriate, having regard to the nature of his activities and the size of his undertaking, for the effective planning, organisation, control, monitoring and review of the preventive and protective measures.”</i></p> <p>The Approved Code of Practice for the regulations expands on the definition of ‘monitoring’ and refers to adequately investigating the immediate and underlying causes of accidents and incidents to ensure remedial action is taken.</p> <p>Regulation 3 also requires employers to review any risk assessment where there is reason to suspect it is no longer valid. The occurrence of an accident or near miss event may call into question the adequacy of any existing controls, but this can only be established by undertaking an investigation into what went wrong.</p>
Reporting of Injuries, Diseases and Dangerous Occurrences Regulations 1995 (RIDDOR)	This is principally concerned with reporting accidents and incidents but, as businesses are required to also report the cause(s) of any reported, there is an implied requirement to investigate the circumstances of the accident or incident.

<p>Railways and Other Guided Transport Systems (Safety) Regulations 2006 (ROGS)</p>	<p>These regulations require railway undertakings, i.e. those organisations:</p> <ul style="list-style-type: none"> • operating trains on the mainline railway; • developing and maintaining infrastructure, other than a station, on the mainline railway; • managing and operating a station on the mainline railway; <p>to be in possession of a safety certificate or authorisation issued by the Safety Regulator (the ORR). In order to obtain that certificate or authorisation, such organisations must provide relevant information as to the nature of their operation and the health and safety arrangements they have in place.</p> <p>Schedule 1 specifies that the information should include the <i>“procedures to ensure that accidents, incidents, near misses and other dangerous occurrences are reported, investigated and analysed and that necessary preventative measures are taken”</i>.</p>
<p>Railways (Accident Investigation and Reporting) Regulations 2005 (RAIR)</p>	<p>Whilst the RAIR applies to the Rail Accident Investigation Branch (RAIB), there may be occasions when the RAIB will permit a rail industry member to investigate an accident or incident and to then review the resulting report.</p>

Industry requirements

<p>Railway Group standards</p>	<p>GO/RT3119 <i>Accident and Incident Investigation</i> contains requirements for Railway Group members (both infrastructure managers and railway undertakings) to undertake investigations of certain types of accidents and incidents.</p> <p>GO/RT3119 requires infrastructure managers and railway undertakings to investigate accidents or incidents to establish:</p> <ul style="list-style-type: none"> • the events leading up to the accident or incident; • the immediate cause(s); • the underlying cause(s); <p>and then to identify recommendations that could mitigate or eliminate the risk from such accidents or incidents in future.</p>
<p>Network Rail company standards</p>	<p>The <i>Reporting and Investigation Manual</i> (RIM) contains the processes (with supporting guidance) for accident and incident reporting and investigation that:</p> <ul style="list-style-type: none"> • will help the company achieve compliance with the requirements of GO/RT3119 and GO/RT8047 <i>Reporting of Safety Related Information</i>; • will identify additional requirements applicable to Network Rail. <p>See the 'Network Rail's Reporting and Investigation Manual' sub-section in Part 8 of this handbook for details of how to access the RIM.</p>

Benefits to be gained from investigation

As discussed above, investigations will help to:

- prevent similar occurrences.
- prevent business losses due to costs of criminal proceedings and claims for compensation.
- improve staff morale.
- improve public perception.

Investigations will also help the organisation to understand:

- How people are exposed to hazards that may affect their safety.
- Why things went wrong and how they went wrong.
- Whether procedures are being followed, i.e. are staff taking short cuts or adopting bad practices?
- Whether the procedures are effective, i.e. are the controls in place effective at controlling the risks to staff, etc.?

HSE publication HSG245 *Investigating Accidents and Incidents* contains the following:

"Carrying out your own health and safety investigations will provide you with a deeper understanding of the risks associated with your work activities. Blaming individuals is ultimately fruitless and sustains the myth that accidents and cases of ill health are unavoidable when the opposite is true. Well thought-out risk control measures, combined with adequate supervision, monitoring and effective management (i.e. your risk management system) will ensure that your work activities are safe. Health and safety investigations are an important tool in developing and refining your risk management system."

Investigations will also help to:

- prevent further similar events occurring.
- reduce losses/costs due to service disruption, criminal prosecutions and civil legal actions, and compensation costs.
- improve employee morale and attitude towards health and safety.
- apply skills and knowledge gained to other activities within the organisation.

Cost of accidents

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Accident pyramid

Studies have shown that there is a statistical relationship between different accident/incident types.

In the 1930s, H.W. Heinrich first proposed that, for every major injury, there were 29 minor injuries and 300 non-injury accidents. This information was presented as a pyramid and is now commonly known as the Heinrich pyramid or “accident pyramid”.

As time passed, the idea developed. In 1969, for example, a study of 1,753,498 industrial accidents was undertaken by Frank E. Bird. The data gathered, revealed that for every serious or disabling injury there were 9.8 minor injuries, 30.2 property damage events and 600 no-loss incidents reported.

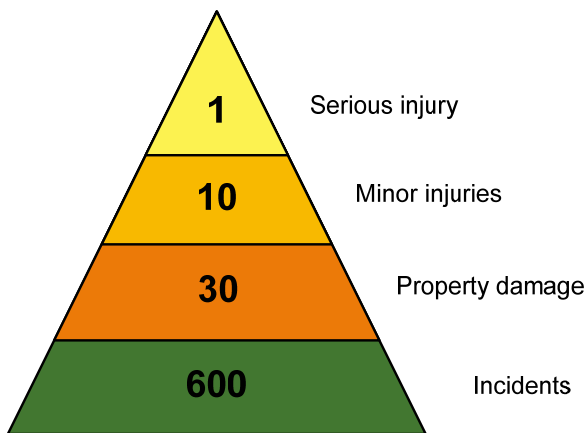


Figure 1 – Accident pyramid

In 1975, a further study concluded that, for each fatal or serious injury, there would be three minor injuries with absence of up to three days, 50 injuries requiring first aid, 80 property damage and 400 non injury/damage accidents.

The exact ratios between the different accident/incident types will depend on:

- how the accidents/incidents are defined;
- the type of accidents/incidents;
- the nature of the industry or business.

Whilst these ratios (and definitions) vary from study to study, the basic principle remains the same – near misses and other underlying factors, if not addressed, will ultimately lead to an accident.

If an organisation does not properly control risks, the outcome of an accident often depends on chance because the outcome of an accident cannot be accurately predicted.

Therefore, the only way to effectively reduce accidents is by controlling the underlying causes of **all** accidents and incidents. Tackling these underlying causes will help to eliminate the losses incurred by unwanted and preventable accidents and incidents.

Investigating all accidents and incidents – rather than only the small number of more serious ones – means that greater knowledge will be gained on the risks faced by the organisation and what can be done to reduce or eliminate these.

The HSE has undertaken a number of studies on accident costs (see [Covered by insurance?](#) sub-section below). The results showed that **8% of the accidents** studied were judged to have **had the potential for more serious consequences**, i.e. fatality, multiple injuries or catastrophic loss. In most of these cases, luck prevented a more serious outcome.

Most accidents have the potential to cause both property damage and personal injury. However, this is not always the case because:

- some injury accidents are unlikely to cause property damage;
- some accidents which cause property damage have no potential to cause personal injury.

Even if an event does not have the potential to cause harm, it may still cost money.

The financial impact

Regardless of whether someone is hurt, an accident will involve costs and, in many cases, these can be very high. Injury costs (i.e. medical treatment and insurance payments) will be only a relatively small part of the overall costs of an accident. The majority of the resulting costs will be the uninsured costs – see [Figure 2](#).

The actual costs of accidents and incidents – and occupational ill-health – to an organisation will depend on a number of factors, including:

- the number of people employed;
- the number of people involved;
- the number of accidents and incidents;
- the value of the equipment, materials, products or services affected.

The impact of the costs will then depend on the annual turnover and, where relevant, the profit margin of the organisation. Any loss will affect the profit margin – the ‘bottom line’ – but for those organisations struggling economically any loss may be serious.

Losing skilled workers, even for a few days, can have a bigger effect than the direct financial costs might suggest. The smaller the organisation the less likely they will be able to cushion themselves against accidental losses – a serious accident could put a small organisation out of business.

The most obvious costs are the damage to equipment and materials, the costs of medical treatment and compensation claims and the costs associated with a person taking time away from work, but there are other costs and these are often not readily apparent.

These costs are not an inevitable part of doing business; the safety performance record of leading businesses demonstrates this.

Bear in mind that the same factors that may create accidents and incidents may also create other quality and cost problems within an organisation's business.

Covered by insurance?

Many will presume that the costs of an accident will be covered by insurance, but insurance will not cover everything and it may only pay for serious injuries or damage.

Where the insurance policy includes an 'excess' this may be greater than any amount for an individual accident or incident.

The following costs are unlikely to be covered by insurance and will still have to be met by the organisation:

	Includes
Lost productivity time	The wages of those unable to work through injury and those unable to work because of idle equipment, plant, trains, etc.
Sickness payments	Sickness payments to those unable to work through injury and possibly those shocked or traumatised by witnessing the accident
Loss of product and/or raw materials and the costs of extra materials	Items not produced because of suspended production; materials damaged or lost in the accident and new, replacement materials purchased
Repairs to plant and equipment	Cost of repairs to damaged plant and equipment
Overtime and cost of temporary workers	Payments made to existing employees working overtime to cover those unable to work
Recruiting and retraining of new employees	Cost of bringing in new employees and training them; cost of re-training existing employees to do the work
Production delays	Costs of delays in production due to idle plant/equipment whilst accident is investigated or whilst repairs are undertaken
Investigation time	The time undertaken by the investigators, including interviewing employees
Fines	Fines arising from possible prosecution
Legal costs	Cost of engaging solicitors in the event of claims for compensation, or costs of a barrister in the event of a court case
Loss of contracts	Poor safety record leading to lost contracts/business
Loss of business reputation	Poor safety record leading to loss of business and higher insurance premiums

The amounts paid out by insurance companies, together with their own costs – and profits, will be charged to the organisations they insure. Higher insurance pay outs will inevitably result in higher insurance premiums for those organisations.

Uninsured costs vary between businesses and the types of accident. They are, however, several times more than the insured costs, which can be likened to the tip of an iceberg. The costs recoverable through insurance are visible, but hidden beneath the surface are the uninsured costs.

Studies have given different ratios for these insured to uninsured costs but studies by the HSE found that the ratio of **insurance premium paid to uninsured losses** ranged from **1:8 to 1:36**. In other words, for every £1 paid in insurance premiums, a further £8 to £36 had to be found to cover the other losses arising from accidents.

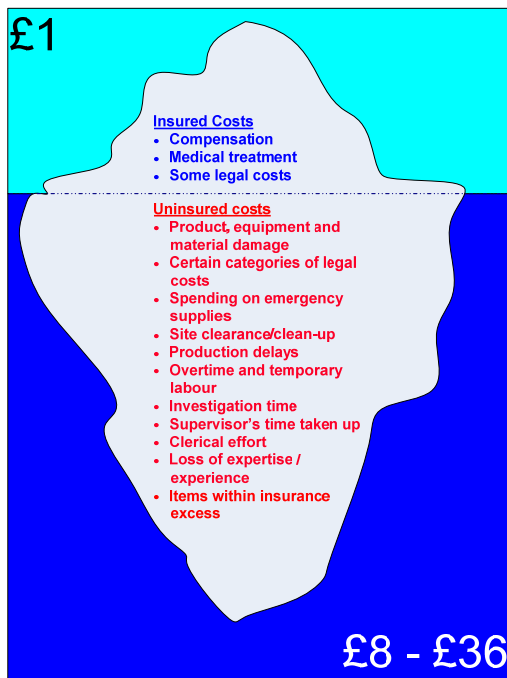


Figure 2 – Cost of accidents iceberg

A poor claims record will lead to an increase in insurance premiums – and insurance cover may actually be refused.

Costs to Network Rail

To put this into context, the following information/data provides a summary of some of the costs incurred by Network Rail following accidents and incidents.

Network Rail's insurance

Network Rail's annual insurance costs are over £90m. A substantial part of that cost relates to claims from accidents and incidents which, if avoided, would be better for both for the people affected and for the business.

In outline, the type, number and cost of the various types of claims Network Rail has each year are (based on 2009 figures):

Employer's Liability – relates to death/injury/disease to employees arising out of the course of their employment.	About 150 claims each year. Result = significant annual claims costs. Over and above this is the cost to the business of lost productivity, temporary labour, and wages during absence, etc. This is often more than the value of the claim and is paid by the business, not the insurers.
Public Liability – relates to death/injury/disease and property damage to members of the public arising out of non-motor accidents and which are the fault of Network Rail.	1,200 claims each year. The annual cost to Network Rail of these claims is around £5m. Where a major accident occurs this amount may multiply many times. Damage to train operators' rolling stock is in addition to these costs.
Motor – relates to death/injury/disease and property damage to members of the public and when the damage to our own vehicles is included	There are about 750 accidents and incidents each year; this excludes those that involve damage to our own vehicles. Costs typically £4.5m per annum.

Property Damage/Business Interruption – this relates to accidental damage to our own infrastructure and the delay costs under the performance regime arising from that damage.

Insurers deal with 150 cases each year which are above the £100k insurance excess and with a typical annual cost of £60m.

The policy excess is paid by the route.

Replacement costs

The following figures were provided by the railway industry and provide an indication of the costs of replacing some equipment, infrastructure and vehicles (based on 2004 prices). These figures are for modern, main-line equipment.

Plain line track, excluding earthworks (per mile)	£600,000 (€558,000)
Re-railing (per mile)	£207,000 (€296,000)
Re-ballasting and re-sleeping (per mile)	£400,000 (€572,000)
Simple turnout (replacement)	£400,000 (€572,000)
DC third rail renewal (per mile)	£175,000 (€250,000)
AC overhead line total renewal incl. supports (per mile)	£500,000 (€715,000)
AC overhead line, contact wire & dropper replacement (per mile)	£100,000 (€143,000)
Diesel locomotive replacement	£1,500,000 (€2,145,000)
Passenger rolling stock vehicle replacement	£1,000,000 (€1,430,000)
Wagon, bulk freight, replacement	£100,000 (€143,000)

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