Managing health and safety at passenger-carrying miniature railways

Guidance for operators of passenger-carrying miniature railways

Preface

The Passenger Carrying Miniature Railway Safety Group (PCMRSG), has drafted this new guide for managing health and safety of passenger-carrying miniature railways.

Following the guidance is not compulsory and you are free to take other action. If you do follow the guidance you will normally be doing enough to comply with the law.

This group comprises representatives of;

- Britain's Great Little Railways,
- Cromar-White,
- Denver Light Railway,
- Midland Federation of Model Engineers,
- National Railway Museum,
- Northern Association of Model Engineers,
- Rother Valley Country Park Railway,
- Southern Federation of Model Engineering Societies,
- The Heywood Society,
- 7¼" Gauge Society,
- 10¼" Gauge Railway Society.

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For further information please contact one of the above organisations/companies.

Managing health and safety at passenger-carrying miniature railways

Across the UK there is strong interest in miniature railways. It is important that the operators of passenger-carrying miniature railways manage the health and safety of all involved with this well-loved leisure activity.

This guide outlines the main risks of passenger-carrying miniature railways and some of the steps that can safeguard the health and safety of employees, operational staff, passengers and visitors, and contains practical advice for operators organising or managing passenger-carrying miniature railways.

Health and safety aspects covered include safety management, layout and design of a railway, the track system, platforms, locomotive and rolling stock design, the control of train movements, level crossings, inspection, maintenance, record keeping, service area safety, noise, safe use of equipment, manual handling, hazardous materials and fire and electrical safety.

This guide contains;

- explanations of what the guidance is about, what is required to comply with the law and what action you should take and why,
- a logical structure that aims to help the reader to scan, understand and assimilate the content,
- information on legislation and links to further guidance.

Contents

Introduction

About this guidance and who it is for

1 Passenger-carrying miniature railways are attractive and exciting, providing enjoyment for participants, passengers and visitors alike.

2 This guidance is aimed at helping organisers and operators of passenger-carrying miniature railways to understand what they need to do to comply with the Health and Safety at Work etc Act 1974 (the HSW Act) and the regulations made under it. (Ref [1])

3 Private clubs and operations run by volunteers may not fall under the legislative regime of the Health and Safety at Work Act but they still have a duty of care to protect their members and visitors. Failure to do so may result in civil litigation.

4 This guide will help with the safe operation at permanent venues such as private clubs and commercial miniature railway attractions or at temporary venues such as portable tracks erected for fairs, garden parties and festivals. It will help organisers to minimise risks in a proportionate way, which does not unduly restrict participation in this leisure activity.

5 This guide is for track gauges up to 350mm (13¾”). Track gauges of 350mm (13¾”) and above fall within the jurisdiction of the Office of Rail and Road (ORR). Very small gauges, up to about 63.5mm (2½"), do not commonly pull passenger-carrying trains, though there may be exceptions.

Managing for health and safety

Getting started

6 As an operator you have a duty to make sure, so far as reasonably practicable, that employees, operational staff, volunteers, passengers, visitors and others, are not exposed to risks to their health and safety arising from your operation. You also need to understand what is required in law and how risks can be minimised.

7 This process is driven by Risk Assessments and suitably qualified/trained personnel to constantly monitor your Health and Safety performance. Your policies should clearly define responsibility and state who does what, how and when. It is also advisable that you have a Rule Book, Code of Practice or Bye Laws for your operation that clearly brings all the operational elements together.

8 A safety management system will help you demonstrate you are meeting your duties. You will find general guidance on managing for health and safety in HSE guidance “Plan, Do, Check, Act (PDCA) - An introduction to managing for health and safety”. (Ref [2])

9 If you are not confident of your ability to manage all health and safety matters in-house you should consider some external help or advice.

Design considerations

The layout and design of the railway

10 The layout and design of the track should be suitable for the type of operation which is planned. You should consider the following when you design or select a location or route;

- the types of trains to be used,
- the location of features such as curves, gradients, pointwork,
- the clearances between passing trains and to lineside structures or objects including headroom at tunnels, bridges or other overhead structures,
- emergency offloading of trains in the case of train failure or train operation ceasing,
- the maximum speeds over different parts of the track,
- the skill, experience and number of operational staff required.

The track system

11 The track system of rails and supports should be suitable for the type of operation which is planned. You should consider the following when you design or select a track system;

- the suitability of the track gauge for the intended operations,
- the capability of the track to support the intended trains (e.g. the load-bearing capacity of the track bed, sleepers and rails or the load-bearing capacity of raised track supporting beams),
- the standards of track installation and maintenance that are required for the safe running of trains.

Platforms

12 You should consider the following when you design platforms;

- the length required to suit the longest train to be operated,
- that wherever practicable they are positioned on straight track with as level gradient as possible,
- that they are wide enough for the unimpeded movement of passengers at the busiest times. You may also consider control measures to prevent platforms becoming overcrowded, or separate loading and unloading platforms to simplify the flow of passengers,
- the visibility along the platform for operational staff. Buildings and other objects should be positioned so as not to obstruct visibility or the movement of passengers,
- the height of the platform to facilitate ease of access to and egress from the carriages,
- the types and position of barriers, controlled areas or other arrangements needed to protect visitors and operational staff.

Locomotive and rolling stock design and construction

13 Vehicles should be suitable for the type of railway which is planned. You should consider the following;

- the wheelset dimensions meet the appropriate design standards and that there is adequate suspension/springing arrangements to accommodate track irregularities under all conditions of load, the length of the vehicle is compatible with the curvature of the track and the vehicle profile (height and width) are compatible with the available clearances,
- vehicles are adequately constructed for the intended purpose. Any vehicles intended to carry persons should have appropriate seating and footrests,
- the vehicle has adequate means for coupling to other vehicles in the train,
- the vehicle has adequate braking provisions for the intended purpose,
- a locomotive must have an adequate system of control, taking into account the particular hazards associated with risks of the power source, e.g. electric locomotives running away through failure of the control system or locomotives being left in gear,
- vehicles that have not run regularly on the track may require a 'fitness to run' examination, prior to being allowed on the track,
- a locomotive, whether powered by steam, battery or internal combustion should have adequate control of emissions.

14 Where a locomotive/vehicle is electrically powered it should be provided with a safety cut out to prevent uncontrolled movement.

The control of train movements (Signalling)

15 Wherever more than one train is in operation on a miniature railway, a system to prevent conflicting train movements is needed. The system of control needs to be as simple as possible. Where safe operation can be achieved by driving on a line-of-sight basis, a signalling system may not be required. Where train control is by line of sight, train speeds should be controlled so that at all times the train can stop within the line-of-sight.

16 A robust system to control train movements is critical to the safe operation of a railway. The primary function of any control system is to;

- maintain a safe distance between trains,
- control access to a section of the line,
- protect against conflicting movements,
- give indications of the route that has been set.

17 The control system should be suitable for the type of operation which is planned and the choice of control system needs to be supported by an appropriate risk assessment. Control systems that you may consider include;

- two-way radio communication,
- tokens, keys or 'staffs' giving authority for access to specific sections of the line,
- a manual system consisting only of signallers or other operational staff giving trackside hand signals,

- a manual signalling system consisting of semaphore or colour light signals operated by signallers or other operational staff,
- an automated or semi-automated signalling system using a train detection system to operate semaphore or colour light signals.

Bear in mind that a combination of control systems along the railway may be appropriate.

Whichever control system(s) is/are selected it is important that all signals return to danger in the event of a failure of the signalling system.

18 You should consider the following when you design or select a manual system using operational staff giving trackside hand signals;

- the skill, experience, training and number of operational staff required to manage the system safely,
- the locations of trackside signallers needed to provide adequate control.

19 You should consider the following when you design or select a manual signalling system consisting of semaphore or colour light signals operated by signallers or other operational staff;

- the frequency of trains,
- the gradients and potential stopping distances of loaded trains,
- the maximum permitted speeds at different parts of the track,
- the location of features such as blind curves, sloping ground, trees and other obstructions to sight lines,
- the type of visual indication to be presented to the train crew including during the hours of darkness or reduced levels of visibility,
- the spacing and location of the visual indications to provide visibility for an adequate length of time on the approach to the signal,
- the skill, experience and number of train operating staff,
- the skill, experience and number of route control staff e.g. signallers, station staff and level crossing controllers,
- the locations where trains are likely to stop as part of the normal running, e.g. the position of the train loading and unloading points.

20 In addition to the above when selecting an automated or semi-automated signalling system you should consider the following;

- the type of train detection system to use,
- that train operating staff rely almost entirely on the safe and reliable operation of automated signalling systems,
- the system design, manufacture and installation should provide for fail safe operation,
- the system should be thoroughly tested and verified for all expected operating conditions,
- a backup system should be in place to manage train operations when a failure occurs, e.g. manual or hand signalling or consideration of ceasing operations.

Level crossings

21 Level crossings present high levels of different sorts of risk. It is essential those risks are assessed and well managed. Wherever practicable, an alternative means of crossing the railway should be provided. Where a level crossing has to be provided, you should consider the following;

- the requirements of all the different sorts of user of the crossing, including road vehicle traffic and pedestrians as well as the trains,
- whether the sight lines, signalling, warning signs and protection barriers are adequate for all users of the crossing,
- where the level crossing is of a public highway or right of way such as a bridleway or footpath, you will need to ensure that the protective arrangements stipulated in the Level Crossing Order issued by the ORR are complied with.

22 Further information is available from Railway Safety Publication, “Level Crossings: A guide for managers, designers and operators”, available from the Office of the Rail Regulator www.orr.gov.uk and in the Railway Group Standard, “Level Crossing Interface Requirements GKRT0192” from Rail Safety and Standards Board Ltd. www.rssb.co.uk

Trackside safety signage

23 Consider the provision of track side signage such as maximum permitted speeds, limited clearances, access prohibition, sound audible warning (whistle or horn), limits of train movement and gradients.

Safety plan and risk assessments

24 As an operator of a permanent site, identify the;

- size, type and scope of the operation,
- number of operational staff, volunteers, passengers, visitors and others,
- location and duration of the operation,
- time of day and year of the operation (as the weather or running in the dark may be significant factors),
- the type(s) of motive power
- the layout of the site

25 Once you have identified the nature and scope of your operation, you should create a safety plan for the safe operation based on an assessment of the risks.

26 If the operation is to take place on a temporary site, the owner of the land is responsible for advising organisers of hazards that are to do with the land, such as buried services or overhead electrical cables.

Producing risk assessments

27 As part of managing health and safety at your railway, you must assess and control the risks. To do this you need to think about what might cause harm to anyone within your site and decide whether you are doing enough to avoid harm as far as is reasonably practicable. This process is known as risk assessment and it is something duty holders are required by law to carry out.

28 A risk assessment is about identifying and taking sensible and proportionate measures to control the risks at your operation, not about creating huge amounts of paperwork.

29 Be aware that the safety precautions for passenger-carrying miniature railway operations will vary widely according to the gauge and layout of the railway. For example, a large-gauge railway running on a permanent track will have different requirements to those for a small-gauge running on a temporary track.

30 Think about how accidents are likely to occur and concentrate on real risks - those that are most likely and which will cause the most harm.

The following might help:

- think about your railway operation, and any processes or substances used that could either injure employees, operational staff, volunteers, passengers, visitors or others, or harm their health,
- ask your team what they think the risks are as they may notice things that are not obvious to you and may have some good ideas on how to control the risks. Speaking to other railway operators can also be helpful,
- recognise that some, operational staff or volunteers may have particular requirements, e.g. new or young staff, new or expectant mothers, people with disabilities, temporary workers and contractors, may be at particular risk,

- recognise also that the behaviour of visitors can be unpredictable. Risk assessment should include consideration of the risks of carrying all age groups,
- consider what could happen to infants, babes in arms, unaccompanied children or those who may be less able to brace themselves with hands or feet in the event of a jolt or an incident while on the train,
- consider also the risks associated with the presence of pets around the railway. The reaction of animals to sudden noise or movement is unpredictable, potentially adding to risks on platforms and if allowed to accompany passengers on the train,
- further advice and guidance may be available from one of the PCMRSG member organisations listed at the front Managing for health and safetyof this document.

31 Having identified the hazards, you then must decide how likely it is that harm will occur. Risk is a part of everyday life and you are not expected to eliminate all risks. What you must do is make sure you know about the main risks and the things you need to do to manage them responsibly. Generally, you need to do everything reasonably practicable to protect people from harm.

32 Make a record of your significant findings - the hazards, how people might be harmed by them and what you have in place to control the risks. Share this with your team.

33 The risk assessments should form part of your safety plan. Diagrams showing the intended location of temporary barriers, areas with restricted or controlled access and visitor viewing areas etc can be helpful. Any record produced should be simple and focused on controls.

34 Risk assessments should set out the frequency of checks, who is responsible for them and the methods they should use.

35 You can find more guidance on the risk assessment process at www.hse.gov.uk/risk

Incidents and emergencies

36 Your safety plan should include procedures to respond effectively to accidents and other emergencies.

37 Procedures should be in proportion to the level of risk presented by operational activities and the potential extent and severity of an incident.

38 Accidents and injuries should be recorded in a book kept solely for that purpose.

Emergency procedures

39 Emergency procedures should address the basic requirements, for;

- protecting everyone from immediate danger,
- warning other trains (you may need to suspend all or part of railway operations according to the situation),
- protecting and informing anyone directly affected,
- management of personnel including those with disabilities within the railway and their evacuation where necessary,

- the use and control of rescue trains must be carefully managed so as not to compromise the safety of other operations,
- summoning the emergency services if required,
- liaison with the emergency services and other authorities.

40 Appoint people to implement your emergency procedures.

41 Make sure that all relevant personnel, no matter what their normal role, understand what they should do in an emergency, e.g. how to raise the alarm or warn participating trains, and whose instructions they should follow. It may be useful to have training exercises to allow those involved to practise their roles.

Managing operations of your railway

Running of your railway

42 Before operations commence there should be a visual inspection of locomotives, driving trucks, coaches, track, platforms and signalling (where provided), including adjacent areas used by the public. A simple checklist will help.

43 Check that new and visiting vehicles are compatible with the railway. (See clause 13 above)

44 A proving run should be undertaken to confirm that all the equipment is in full working order. Details should be recorded and signed for by the designated person-responsible for the overall safe operation of the railway.

45 Any moving locomotive must be under direct control at all times. To achieve this, the following should be assessed;

- that the locomotive in good running order, with current appropriate certification and suitable for its proposed duties,
- that the person in control competent and familiar with the locomotive controls,
- that there is an adequate system for braking both when stationary and in motion,
- that there is a suitable and secure coupling system between the locomotive, its tender or driving vehicle and the train,
- that there adequate protection against uncontrolled movement, particularly with the use of any wireless/remote control system,
- that the person in control has an uninterrupted visibility of the track ahead.

46 Other items of rolling stock should be checked for;

- their fitness to run,
- their stability, both with and without a full load, and during loading and unloading,
- suitability and security of couplings,
- adequate system for braking both when stationary and in motion,
- suitability and condition of any seating, foot boards, step plates and handles.

47 Passengers should be instructed on the safe riding on miniature trains, e.g. to sit upright and keep their feet and arms within the vehicle. Warning notices should also be plainly visible at key points, such as ticket offices, coaches, platforms etc. It may be appropriate to use verbal instruction, which should be repeated frequently e.g. before every train departure.

48 Once the railway opens, attention should move away from planning to the effective management and monitoring of running the railway. There should be a designated person responsible for the overall safe operation of the railway. All relevant persons need to be aware of who this is e.g. by means of a briefing or suitable notice.

49 As the designated person check that there is co-operation and proper co-ordination of all activities on the site. The designated person may delegate some of the responsibilities to other competent persons.

50 To minimise risks to health and safety, appropriate guidance on the operation of the railway should be provided to all relevant persons, as identified by your risk assessment. For example, you may need to tell people about;

- site hazards,
- safe speeds,
- what to do in the event of an emergency,
- first aid, toilets and wash facilities,
- communication systems,
- signalling or other means of train control.

51 It may also be necessary to provide relevant health and safety information to participants, passengers and visitors, e.g. in the form of warning notices.

52 The competencies of operational staff may need to be assessed to ensure that they fully understand your operational procedures. These are most likely to be contained in your Rule Book, Code of Practice or Bye Laws.

Competence of operational personnel

53 All operational staff should know how to perform their tasks safely and without risks to themselves or others. There should also be an appropriate level of competent supervision, proportionate to the risk, nature of the task and the personnel involved. Operational staff need to be competent to manage the aspects of operation that they are responsible for.

54 Operational staff should undergo evaluation to verify that they are competent to undertake the required tasks. Retraining or refreshers may be required for them to remain competent, especially if there are any significant changes to their responsibilities and/or the systems that they are using.

55 Operational staff involved with the movement of trains should undergo evaluation to verify that they are familiar with the system for the control of train movements (signalling). Retraining or refreshers may be required for them to remain competent, especially if there are any significant changes to their responsibilities and/or the systems that they are using.

56 All records of training and competency assessment should be kept.

57 Some passenger-carrying miniature railways have a system of progression for driver and guard training. You could also consider giving younger operating staff separate running periods.

58 Think about how you will deal with operational staff who fail to comply with instructions and put themselves and others at risk. You may have to stop the operation temporarily or replace the member of the operational staff.

59 You may also need to take steps to prevent operational staff from taking part if they are under the influence of alcohol, drugs or medication that may impair their ability to perform their duties safely. It is generally considered that anyone who would be unfit to drive a motor vehicle on the public highway is unfit to undertake any safety critical role.

Monitoring and review of safety performance

60 You should periodically check your methods for controlling risks during your operation to make sure they are working and being followed.

61 For larger operations, a number of people may share the monitoring role. Whoever is the designated person responsible for the overall safe operation of the railway should be familiar with the risk assessment findings, control measures and be able to identify new hazards and assess risks as they arise on the day.

Reporting accidents and incidents

62 All operators of miniature railways have duties under the Reporting of Injuries, Diseases and Dangerous Occurrences Regulations 2013 (RIDDOR). You will find further information about what must be reported and how to report it at www.hse.gov.uk/riddor or in the leaflet “Reporting accidents and incidents at work” (Ref [3])

63 The reports made under RIDDOR are separate to any which might be required for insurance purposes.

Maintenance

Inspection, maintenance and record keeping

64 For any railway to operate reliably and safely, it is important that track, locomotives, rolling stock, control systems, etc. receive adequate maintenance. There should be a planned system of maintenance to include;

- inspection
- testing
- lubrication
- cleaning
- adjustment or repair

65 The frequency of inspection will be determined by the complexity of the individual piece of equipment and frequency of use. Your risk assessments should consider the maximum time acceptable between inspections and the details be included in your Rule Book, Code of Practice or Bye Laws.

66 Inspections should be undertaken by someone who is competent, i.e. someone with adequate knowledge and expertise in relation to the equipment being inspected.

67 Checklists will assist those undertaking the inspections to complete all elements of the inspection.

68 Defects identified during inspection should be recorded and arrangements made to remedy the fault. It may be necessary to remove the equipment from use or impose suitable restrictions so that safety is not compromised until such time as a full repair can be completed.

69 Records of inspections should not only record defects found and actions taken, but where no fault is found during a routine inspection, this fact should be recorded as evidence that the prescribed inspection has been undertaken.

Track

70 Regular inspections of the track should consider the following;

- the condition of the support system to raised tracks and the effectiveness of the system used to attach the track to the support system,
- that the system used to attach the rails to the sleepers is secure and bolted fasteners, such as fishplates, are secure,
- the alignment of ground level tracks particularly where prone to movement during hot weather,
- that the cant or cross-level of the track is correct or within acceptable tolerance from the design,
- that switch rails of points/turnouts are fully “home” in both normal and reverse settings. This is particularly important at facing points/turnouts,
- signs of damage to check and wing rails in points/turnouts. This may indicate that non-compatible wheelsets are in use or the presence of wide gauge trackwork.

Locomotives and rolling stock

71 To assist with record keeping and maintenance, you should consider a numbering system that uniquely identifies vehicles and major interchangeable sub-assemblies for assisting the completion of inspection and maintenance records.

72 Locomotives and rolling stock should be inspected for general wear and any signs of damage.

73 Steam locomotives are subject to both initial and subsequent regular testing of the boiler and other pressure components according to the requirements of the Pressure Equipment Regulations (PER) and the Pressure Systems Safety Regulations (PSSR) (See [4] and [5] in References and further reading)

74 It is your responsibility to verify that pressure vessels have valid certification for operation. (Ref [6])

Control systems

75 All equipment used for the control of trains, either fixed or portable, should be checked for correct operation at the intervals determined by your risk assessment.

76 Where lineside signals or indications are installed in areas where bushes or trees are growing, adequate visibility of the signal by the train driver should be confirmed.

77 Backup equipment should also be confirmed as ready for use.

Other infrastructure

78 The correct operation of all equipment associated with a level crossing must be verified at the interval determined by your risk assessments.

79 Platform areas should be checked for the presence of trip and slip hazards.

80 Bridges, tunnels and other lineside buildings should be examined for any signs of degradation that may affect the stability of the structure or the passage of a train.

81 Other items of the infrastructure, such as clearances, fences, track side signs etc. should be confirmed as being satisfactory.

Visitor and Operational Staff safety

82 Be proportionate in your approach to managing visitors. Tailor your safety measures to the number and type of visitors you expect and to the layout of the venue/railway. For example, a public open day is likely to attract more visitors than a private society-organised meeting and so may require more in the way of management. Previous attendance figures and experience should help you to evolve and plan your approach.

83 You should provide visitors with appropriate information to help safeguard their health and safety. For example, it is a good idea to provide information about the risks associated with passenger-carrying miniature railways on websites and notices around the railway.

84 Operational staff may need to communicate with people, especially if there is an incident or emergency. If you plan to use a public-address system or loud hailer it is important that it is audible and intelligible to the target audience.

85 Take reasonable steps to keep pathways free from slip and trip hazards.

86 If you are expecting people to travel by car to the venue, you may need to arrange for adequate parking which should be well signposted. Alternatively, car parking stewards may need to be available at busy times to direct drivers to a parking space.

Regulated areas

87 You will need to take reasonable steps to reduce the risks to visitors and operational staff from moving trains. Your risk assessment may identify areas of the operational railway where access by visitors and/or operational staff should be regulated. You may like to consider the following;

- Prohibited areas - where both operational staff and visitors are prevented from entering while trains are in operation,
- Restricted areas - open to operational staff but restricted to visitors unless authorised and accompanied by a member of the operational staff,
- Controlled areas close to the operational railway, open to visitors under the control of operational staff.

Prohibited areas

88 You may decide to prohibit access when trains are moving, to locations with limited clearance or visibility. These may include;

- tunnels,
- bridges,
- blind curves,
- cuttings or embankments.

Such areas should be clearly marked, e.g. by warning notices but you may also consider providing stewards to direct and inform people, and to prevent them from entering prohibited areas. Stewards should be easily identifiable (e.g. wearing name badge or club shirt)

Restricted areas

89 Your risk assessment may identify areas where access by visitors should be restricted. During your planning you should consider the appropriate method for restricting visitor access to;

- locomotive and rolling stock unloading and loading facilities,
- locomotive preparation areas,
- boiler blow down and ash pit areas,
- turntables,
- running tracks,
- workshops,
- operational control locations such as signal boxes

Appropriate control methods could include fences/barriers, stewards and/or notices.

Controlled areas

90 Your risk assessment may also identify areas where access is allowed under controlled conditions. During your planning you should consider the appropriate method for controlling visitor access to,

- platforms,
- level crossings,
- viewing areas.

91 At places where members of the public may not be aware that a railway is operating, such as across a path, you should decide on the most appropriate method of control. It could be by signs, temporary barriers, the posting of operational staff along the path and/or instructions to drivers on what to do when approaching members of the public. Control could be by an audible whistle/horn and the driver being prepared to bring the train to a halt if necessary. You may also wish to consider speed limits in such areas.

92 The choice of any physical barrier or fence will depend on a number of factors, including;

- the distance from the track,
- restriction of a drivers view of any signals or the track ahead,
- the condition and levels of the ground on each side of the barrier or fence.

Locomotive preparation area safety

93 Key hazards in locomotive service areas include moving trains, slip and trip hazards, ash pits and the presence of flammable fuel.

94 Normally, only operational staff should be permitted to enter the area, and then only if they can be easily identified (e.g. wearing name badge or club shirt)

95 You may decide to allow visitors, when specifically authorised, to enter the area to talk to drivers and view their locomotives. Such visitors should be accompanied by a member of the operational staff and be clearly identified to other operational staff by means of suitable clothing or badge. You may need to limit the number of people admitted at any one time and the period that they can enter.

96 Your procedures should cover safety and operational briefing of drivers and visiting participants about the system used for the control of train movements.

Use and storage of fuel

97 Gas or liquid fuels are fire and explosion hazards and should be stored and handled properly. This is particularly important in the vicinity of locomotives in steam or other naked flame. You should have a system of safety precautions to deal with incidents which might occur when refuelling is taking place or where fuel is being stored.

98 At most small operations, individual participants bring their own fuel in small containers. Participants should be advised that fuel should be only be carried in containers that are suitable for that purpose and, to help with identification, liquid fuel containers should be appropriately marked. The transportation of small quantities of flammable liquids is covered by HSE Guidance, “Portable petrol storage containers” (Ref [8])

99 Because of the risks, storing petrol safely is covered by legislation and this applies to you if you store petrol. The regulations (Ref [20]) apply to;

- workplaces that store petrol where petrol is dispensed directly into the tank of a vehicle with an internal combustion engine, i.e. retail and non retail petrol filling stations,
- non-workplace premises storing petrol, for example at private homes, or at clubs/associations (or similar).

100 Guidance on the storing of petrol is available is available from the HSE (Ref [19])

101 Refuelling with flammable fluids is potentially dangerous and should be undertaken in a designated area adequately ventilated and away from sources of ignition such as hot surfaces or sparks produced by tools. It is essential that the areas where fuel is handled are kept clean and free from rubbish. Appropriate fire-fighting equipment should be maintained in such areas and operational staff should be competent to use it.

General fire safety

102 Those providing venues for public events also have legal duties under the Regulatory Reform (Fire Safety) Order 2005, which applies in England and Wales. In Scotland, requirements on general fire safety are covered in Part 3 of the Fire (Scotland) Act 2005, supported by the Fire Safety (Scotland) Regulations 2006. The legislation requires a responsible person to assess the risk from fire to those using the premises and to make sure that the fire safety measures in place are suitable to protect lives in the event of a fire.

103 Where the railway is within another venue, operation organisers should discuss with the venue owner what fire safety arrangements are in place and make sure they know what to do should a fire break out. This should link to your plans for dealing with incidents and emergencies.

104 At most workplaces the local fire and rescue authority is responsible for enforcing general fire safety and if you need advice you should contact them. The Department for Communities and Local Government, Scottish and Welsh governments will provide similar information to help you meet your responsibilities.

Noise

105 The Noise at Work Regulations 2005 (NAWR) (Ref [9]) require you to take reasonable steps to protect your employees from noise that could damage their hearing. The duties in NAWR, while not directly applying to volunteers or visitors, extend the general duties set out in the HSW Act which require the safeguarding of the health and safety of people who are not your employees, e.g. voluntary staff and visitors.

106 Noise likely to cause hearing damage is not likely to be encountered as part of the operation of passenger-carrying miniature railways. The only significant events capable of causing hearing damage are likely to be a person being very near (i.e. much less than 1m) to a steam whistle or steam safety valve. Even then, the noise exposure is likely to be very brief and below any action level (Ref [10]).

107 Lower noise levels may have other safety implications than direct hearing damage. You should consider the following aspects of noise from your operation;

- Sudden noises, e.g. a whistle or safety valve operating may startle nearby persons, especially young children, causing them to react,
- such reactions may result in the person falling or dropping items being carried or jumping and injuring a nearby person or themselves,
- A succession of noises from an operation may cause nuisance to neighbours, especially if they are repeated regularly,
- The use of locomotive and guard whistles and PA systems should be restricted to the essential requirements for safe operation and the area and duration of the activity.

108 Hearing protection should not be used as an alternative to controlling noise.

109 Some people attend passenger-carrying miniature railway operations regularly and will be at greater risk of long-term damage due to repeated or continual exposure periods. If your risk assessment indicates that there is a risk to health for employees exposed to noise, they should be placed under appropriate health surveillance (regular hearing checks).

110 For further information, visit HSE's noise webpages: www.hse.gov.uk/noise

Manual Handling

111 Manual handling causes over a third of all workplace injuries. These include work-related musculoskeletal disorders (MSDs) such as pain and injuries to arms, legs and joints and repetitive strain injuries of various sorts.

112 At passenger-carrying miniature railway operations there may be a range of manual handling tasks involving lifting, lowering, pushing, pulling and carrying. If any of these tasks are not carried out appropriately there is a risk of injury.

113 Manual handling injuries can have serious implications for both you and the person who has been injured. They can occur almost anywhere in the workplace and heavy manual labour, awkward postures and previous or existing injury can increase the risk.

114 To help prevent manual handling injuries at your railway you should avoid such tasks as far as possible. However, where it is not possible, you must look at the risks of that task and put sensible health and safety measures in place to prevent and avoid injury, using lifting aids where necessary.

Machinery, plant and equipment

115 You should consider how your operational personnel use machinery and have adequate maintenance arrangements in place to make sure equipment remains safe to use.

116 All machinery, plant and equipment need to be safety checked and, where appropriate, be included in the risk assessments..

Electrical safety

117 Electricity can kill or cause severe injury or damage to property and lead to other types of injuries, such as falls.

118 You must ensure that the electrical installation or equipment is suitable for where it is going to be used and is properly installed and maintained. Equipment which is installed or used outdoors should be of suitable weatherproof construction.

119 Where electrical power is required to signals or turnouts, “Separated” or “Safety Extra-Low Voltage” (SELV) systems should be considered.

120 Portable electrical equipment is covered by statutory regulations and HSE guidance is available. (Ref [18])

Battery charging

121 Explosive gases are given off when vented batteries are charged. The risk of an explosion is great if the gases are allowed to collect. Always use a dedicated, well ventilated charging area.

122 Do not smoke, carry out hot work (e.g. welding, brazing, grinding) or use a mobile phone in the charging area.

123 Do not charge batteries beneath electric lights or other equipment that could be an ignition source.

124 Check that the charging equipment is suitable for the battery e.g. correct voltage and charging rate.

125 Battery charging locations should be the subject of a risk assessment that considers;

- the suitability of the location for the purpose,
- the training and competency of personnel responsible for battery charging,
- arrangements for the topping up of battery cells,
- protection against short circuits that could cause explosion.

126 Guidance on using electric storage batteries safely is available from the HSE (Ref [21])

Harmful substances

127 Many materials or substances found at passenger-carrying miniature railway venues could harm your health. These might include;

- fuel,
- exhaust fumes in train workshops or where operations take place indoors,
- waste oil,
- paints, solvents and timber preservatives,
- weed killer.

128 Control measures include;

- changing the process to reduce risks (e.g. lower the temperature to reduce the amount of vapour produced),
- controlling exposure at source by enclosing the process or activity to minimise escape or release,
- providing appropriate personal protective equipment (PPE),
- planning the storage and disposal of materials,
- making sure the workplace is easily cleaned,
- providing washing and changing facilities.

Asbestos

129 Breathing in air containing asbestos fibres can lead to asbestos-related diseases, mainly cancers of the lungs and chest lining. Some older steam locomotive boilers were clad with materials which may have contained various types of asbestos. This subject is covered by HSE Guidance which must be followed.

Personal Protective Equipment (PPE) for operational staff

130 You have duties concerning the provision and use of PPE for anyone working on the railway. PPE should only be used where the risk cannot be adequately controlled in other ways

131 Where your risk assessments identify the need for PPE to be used to protect the user against health or safety risks, you should consider the following types of PPE;

- suitable clothing,
- safety footwear,
- head protection,
- eye protection,
- ear protection,
- hand protection,
- respiratory protection.

132 When selecting PPE, make sure it is CE-marked and it suits the user in terms of size, fit etc. If more than one item of PPE is worn at the same time, make sure they can be used together, e.g. wearing safety glasses may disturb the seal of a respirator causing air leaks.

133 Make sure that users of PPE are instructed and trained on its use and it is maintained and available at all times.

First aid

134 You are responsible for making sure that your operational staff receive attention if taken ill or injured at the railway. Your arrangements will depend on the particular circumstances and you need to assess what your first-aid needs are.

135 As a minimum, there should be available;

- a suitably stocked first-aid box, checked on a regular basis to confirm items are in-date
- an appointed person to take charge of first-aid arrangements,
- information for all operational staff giving details of first-aid arrangements.

136 You might decide that you need a first-aider, i.e. someone trained by an approved organisation who holds a qualification in first aid or emergency first aid. Find more guidance on first aid at work at www.hse.gov.uk/firstaid

Provision of rescue equipment

137 Rescue equipment may be needed where there is a risk of a participant becoming trapped by or under a train. Equipment should be readily and easily available and of a type which, as far as possible, does not pose any additional risk to the injured person. For example, with some cutting equipment there is a risk of sparks, which could cause a fire if there has been a leakage of fuel or flammable vapour. Equipment powered by compressed air or hydraulic systems may be a safer alternative.

Useful contacts

Passenger-carrying miniature railway organisations

The following organisations/companies may be able to provide additional information on the subjects covered in this document.

Britain's Great Little Railways,
http://www.bglr.org/

Cromar-White. Miniature Railway Suppliers,
http://www.cromarwhite.co.uk/

Denver Light Railway,
http://www.denverlightrailway.co.uk

Midland Federation of Model Engineers,
http://www.mfmes.org.uk/

National Railway Museum,
http://www.theheywoodsociety.co.uk/

Northern Association of Model Engineers,
http://nameng.org.uk

Rother Valley Country Park Railway,
Rother Valley Country Park, Mansfield Road, Wales Bar, Sheffield S26 5PQ

Southern Federation of Model Engineering Societies,
http://www.sfmes.co.uk

The Heywood Society,
http://www.theheywoodsociety.co.uk/

7¼" Gauge Society,
http://www.sevenandaquarter.org/

10¼" Gauge Railway Society,
http://www.tenquarter.org

References and further reading

References

1 Health and Safety at Work etc Act 1974 (c37) The Stationery Office 1974
www.legislation.gov.uk

2 Plan, Do, Check, Act: An introduction to managing for health and safety INDG275(rev1) HSE 2013
www.hse.gov.uk/pubns/indg275.htm

3 Reporting accidents and incidents at work: A brief guide to the Reporting of Injuries, Diseases and Dangerous Occurrences Regulations 2013 (RIDDOR) INDG453(rev1) HSE 2013
www.hse.gov.uk/pubns/indg453.htm

4 Pressure Equipment (Safety) Regulations 2016,
http://www.legislation.gov.uk/uksi/2016/1105/pdfs/uksi_20161105_en.pdf

5 Pressure System Safety Regulations 2000, http://www.legislation.gov.uk/uksi/2000

6 The examination and testing of miniature steam boilers (Revised edition 2018). A test code produced by the Model Engineering Liaison Group (MELG) and available from the Associations/Federations/Societies listed above in “Useful contacts”.

7 Guide to safety at sports grounds (‘The Green Guide’) (Fifth edition) Sports Grounds Safety Authority 2013
www.safetyatsportsgrounds.org.uk/publications/green-guide

8 Portable petrol storage containers HSE 2014
www.hse.gov.uk/fireandexplosion/portabable-petrol-storage-containers.pdf

9 Controlling noise at work. The Control of Noise at Work Regulations 2005. Guidance on Regulations L108 (Second edition), HSE Books 2005
www.hse.gov.uk/pubns/books/l108.htm

10 Some frequently asked questions on noise at work.
http://www.hse.gov.uk/noise/faq.htm

11 Manual handling at work: A brief guide INDG143(rev3) HSE 2012
www.hse.gov.uk/pubns/indg143.htm

12 Power take-offs and power take-off drive shafts AIS40 HSE 2013
www.hse.gov.uk/pubns/ais40.htm

13 Disposal of asbestos waste Asbestos essentials EM9 HSE 2012
www.hse.gov.uk/asbestos/essentials/

14 More information is available on COSHH at
http://www.hse.gov.uk/coshh/basics.htm

15 For HSE’s electrical safety webpages
www.hse.gov.uk/electricity/index.htm

16 Work machinery and equipment
www.hse.gov.uk/work-equipment-machinery/index.htm

17 More information about Musculoskeletal disorders is available at www.hse.gov.uk/msd and in 'Manual handling at work: A brief guide'

18 Guidance on Maintaining portable electrical equipment is available at http://www.hse.gov.uk/pUbns/priced/hsg107.pdf

19 Guidance on storing petrol safely is available at http://www.hse.gov.uk/fireandexplosion/petroleum.htm

20 The Petroleum (Consolidation) Regulations 2014 http://www.legislation.gov.uk/uksi/2014/1637/pdfs/uksi_20141637_en.pdf

21 HSE publication "Using electric storage batteries safely" containing guidance on charging is available at http://www.hse.gov.uk/pubns/indg139.pdf

Further reading

Relevant publications

Health & Safety Made Simple. The basics for your business INDG 449
This guide is for employers and those who want some basic information on what they must do to make sure their businesses comply with health and safety law.
http://www.hse.gov.uk/pubns/indg449.pdf

Risk Assessment. A Brief Guide to Controlling Risks in the Workplace. INDG 163
This revised leaflet aims to help you identify, assess and control health and safety risks associated with workplace hazards – the guidance replaces 'Five steps to risk assessment'.
http://www.hse.gov.uk/pubns/indg163.htm

Control of substances hazardous to health (COSHH). The Control of Substances Hazardous to Health Regulations 2002 (as amended). Approved Code of Practice and guidance L5 (Sixth edition), HSE Books 2013
www.hse.gov.uk/pubns/books/l5.htm

Dangerous substances and explosive atmospheres. Dangerous Substances and Explosive Atmospheres Regulations 2002. Approved Code of Practice and guidance L138 (Second edition), HSE Books 2013
www.hse.gov.uk/pubns/books/l138.htm

Safe use of lifting equipment. Lifting Operations and Lifting Equipment Regulations1998. Approved Code of Practice and guidance L113 (Second edition), HSE Books 2014
www.hse.gov.uk/pubns/books/l113.htm

Safe use of work equipment. Provision and Use of Work Equipment Regulations 1998. Approved Code of Practice and guidance L22 (Fourth edition), HSE Books 2014
www.hse.gov.uk/pubns/books/l22.htm

Storage of flammable liquids in containers HSG51 (Third edition), HSE Books 2015
www.hse.gov.uk/pubns/books/hsg51.htm

Workplace health, safety and welfare. Workplace (Health, Safety and Welfare) Regulations 1992. Approved Code of Practice and guidance L24 (Second edition), HSE Books 2013
www.hse.gov.uk/pubns/books/l24.htm

Health and safety at work legislation

Find regulatory text at www.legislation.gov.uk

Petroleum (Consolidation) Regulations 2014 SI 2014/1637

The Carriage of Dangerous Goods and Use of Transportable Pressure Equipment Regulations 2009 SI 2009/1348

The Management of Health and Safety at Work Regulations 1999 SI 1999/3242 (see also www.hse.gov.uk/pubns/books/l21.htm)

Other relevant legislation

Find regulatory text at www.legislation.gov.uk

Regulatory Reform (Fire Safety) Order 2005 (applies in England and Wales, and under the Fire (Scotland) Act 2005 as amended, and the Fire Safety (Scotland) Regulations 2006) Cover general fire safety

Safety at Sports Grounds Act 1975 and the Fire Safety and Safety of Places of Sport Act 1987 cover events held at sports grounds (see also www.safetyatsportsgrounds.org.uk)

The Equality Act 2010, which replaced the Disability Discrimination Act 1995 (except in Northern Ireland) requires reasonable adjustments to be made to provide access for the disabled. This is not only to access a workplace or access shops and services, but also associations and private clubs. For further information go to https://www.gov.uk/guidance/equality-act-2010-guidance

Licensing Act 2003 and Civic Government (Scotland) Act 1982. Events that are attended by members of the public may require an entertainment licence

Food Safety Act 1990 (as amended) (see also www.food.gov.uk)

Useful links

The health and safety toolbox: How to control risks at work
www.hse.gov.uk/toolbox/index.htm

The Health and Safety (First-Aid) Regulations
www.hse.gov.uk/firstaid

Manual Handling Operations Regulations
www.hse.gov.uk/msd/index.htm

The Provision and Use of Work Equipment Regulations (PUWER)
www.hse.gov.uk/work-equipment-machinery/index.htm

Lifting Operations and Lifting Equipment Regulations (LOLER)
www.hse.gov.uk/work-equipment-machinery/loler.htm

Control of Substances Hazardous to Health Regulations (COSHH)
www.hse.gov.uk/coshh/index.htm

The Dangerous Substances and Explosive Atmospheres Regulations 2002 (DSEAR)
www.hse.gov.uk/fireandexplosion/dsear-regulations.htm

RIDDOR - Reporting of Injuries, Diseases and Dangerous Occurrences Regulations 2013
www.hse.gov.uk/riddor/index.htm

Further information

This document is available to read or download at www.pcmrsg.org
For a printed copy (for which a charge may be made) please contact any of the passenger-carrying miniature railway organisations listed on page 24

Notes:

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