

# Train protection systems and Mark I rolling stock

Railway Safety Regulations 1999



GUIDANCE ON  
REGULATIONS

**L120**

HSE BOOKS

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## Introduction

1 The Railway Safety Regulations 1999<sup>1</sup> set new requirements on the installation of train protection systems on the railway, and on Mark I rolling stock and rolling stock with hinged doors. After specified dates, train operators will be prohibited from operating, and infrastructure controllers will be prohibited from allowing the operation of:

- (a) trains without train protection systems;
- (b) Mark I passenger rolling stock; and
- (c) rolling stock having hinged doors without central locking.

The Regulations also make a change to an existing requirement to report 'signals passed at danger' (SPADs) to the Health and Safety Executive (HSE).

2 Different provisions of the Regulations come into force at different times:

A programme for installing train protection systems and bringing them into service must be approved by HSE before -	30 January 2000
New reporting requirement for SPADs from -	1 April 2000
Mark I rolling stock must be withdrawn, rebodied or modified before -	1 January 2003
Train protection systems must be installed before -	1 January 2004
Any modified Mark I rolling stock must be withdrawn or rebodied before -	1 January 2005
Passenger rolling stock which has hinged doors without central locking must be withdrawn or have central locking fitted before -	1 January 2005.

3 The Railway Safety Regulations are reproduced in italics in this publication. The guidance refers to a number of publications or other Regulations which are listed in greater detail in Appendix 1.

4 New or altered trains and equipment will be introduced as a result of these Regulations. These are required to have HSE approval under the Railways and Other Transport Systems (Approval of Works, Plant and Equipment) Regulations 1994<sup>2</sup> before being taken into use. HM Railway Inspectorate has produced a substantial body of guidance in several volumes entitled *Railway safety principles and guidance*<sup>3</sup> (RSPG), intended to guide those involved in the design and construction of new works, plant and equipment, and alterations, and those seeking approval. Applications for approval should be made in writing to HM Railway Inspectorate, Health and Safety Executive, Rose Court, Southwark Bridge, London SE1 9HS and marked for the attention of the Approvals Manager.

5 The guidance which follows covers:

- (a) the meaning of 'railway' and other terms in these Regulations. The provisions on train protection systems and rolling stock apply only to 'railways' as defined in the Schedule to the Regulations. This and other definitions are crucial to an understanding of the Regulations;
- (b) train protection systems (paragraphs 14 to 44);
- (c) Mark I rolling stock (paragraphs 45 to 52);
- (d) prohibition of hinged doors (paragraphs 53 to 55);
- (e) exemptions (paragraphs 56 to 62); and
- (f) reporting of signals passed at danger (paragraphs 63 to 65).

## Regulation 1

### Regulation

1

## Citation and commencement

*These Regulations may be cited as the Railway Safety Regulations 1999 and shall come into force on 30 January 2000 except regulation 4 which shall come into force on 1 January 2003, regulation 5 which shall come into force on 1 January 2005, and regulation 7 which shall come into force on 1 April 2000.*

## Regulation 2

### Regulation

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## Interpretation

(1) *In these Regulations, unless the context otherwise requires -*

*"approved" means approved for the time being in writing;*

*"buffer stop" means a buffer stop at the end of a passenger platform;*

*"emergency crossover" means a connection between two railway tracks to enable trains to change tracks and which is used -*

(a) *in an emergency, or*

(b) *to enable engineering work to be carried out;*

*in accordance with special procedures established by the infrastructure controller;*

*"excessive speed" in relation to -*

(a) *an approach to a stop signal or buffer stop, means such speed as would prevent the train from stopping at that signal or buffer stop,*

(b) *an approach to part of the railway where there is a speed restriction, means such speed as would prevent the restriction from being complied with when the train enters that part, and for the purposes of this sub-paragraph a speed restriction shall be treated as being complied with if the speed of the train does not exceed the total of the permitted speed and such additional speed as may be approved by the Executive for the purpose of this sub-paragraph;*

*"infrastructure controller" has the meaning assigned to it by regulation 2(1) of the Railways (Safety Case) Regulations 1994<sup>(a)</sup>;*

*"line speed" means the highest of the permitted speeds on the railway concerned;*

*"Mark I rolling stock" means rolling stock which has a structural underframe which provides its own longitudinal strength and has a passenger compartment created on the underframe which relies mainly on the underframe for its longitudinal strength;*

*"permitted speed" means the maximum speed permitted on the part of the railway concerned;*

*"railway" has the meaning assigned to it by the Schedule to these Regulations;*

*"relevant approach" means -*

(a) *an approach to a stop signal referred to in sub-paragraph (a) (i) of the definition of "train protection system" in this regulation except where a train travelling at the maximum speed it could attain on that approach would be stopped within the distance between the signal and the point where it could collide with another train by reason of the train protection system installed at the stop signal;*

(a) SI 1994/237.

## Regulation

- (b) an approach to part of the railway where there is a speed restriction if -
- (i) the permitted speed on that approach is 60 miles per hour or more; and
  - (ii) in order to comply with the restriction, a train travelling at the permitted speed on that approach would need to have its speed reduced by one third or more;

(c) an approach to a buffer stop;

"speed restriction" means a permitted speed other than the line speed;

"stop signal" means a signal conveying to the driver of the train an instruction that he should stop the train except that it does not include-

- (a) a signal provided for shunting purposes only;
- (b) a hand signal; or
- (c) a buffer stop;

"temporary speed restriction" means a speed restriction which is in place for no longer than 3 months and used in accordance with special procedures established by the infrastructure controller;

"train" has the same meaning as in section 83(1) of the Railways Act 1993<sup>(a)</sup>;

"train protection system" means equipment which -

- (a) causes the brakes of the train to apply automatically if the train -
  - (i) passes without authority a stop signal such passing of which could cause the train to collide with another train, or
  - (ii) travels at excessive speed on a relevant approach;
- (b) is installed so as to operate at every stop signal referred to in sub-paragraph (a), except a stop signal on the approach to an emergency crossover, and at an appropriate place on every relevant approach;

except that where it is reasonably practicable to install it, it means equipment which automatically controls the speed of the train to ensure, so far as possible, that a stop signal is not passed without authority and that the permitted speed is not exceeded at any time throughout its journey.

(2) Nothing in these Regulations shall require equipment referred to in sub-paragraphs (a) and (b) of the definition of a train protection system to function in relation to a temporary speed restriction, and accordingly any reference in these Regulations to the permitted speed in relation to such equipment is, in a case where a temporary speed restriction is in place, a reference to the permitted speed which normally applies on that part of the line concerned.

(3) Any reference in these Regulations to a person operating a train or rolling stock is a reference to the person operating a train or rolling stock for the time being in the course of a business or other undertaking carried on by him (whether for profit or not), but it does not include a self-employed person by reason only that he himself drives or otherwise controls the movement of a train.

(4) Any reference in these Regulations, except regulation 4, to a train colliding with another train does not include a reference to a train colliding with the rear of another train travelling in the same direction on the same track.

(a) 1993 c.43.

## Regulation

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- (5) Any reference in these Regulations to -
- (a) a numbered regulation is a reference to the regulation in these Regulations so numbered, and
  - (b) a numbered paragraph is a reference to the paragraph so numbered in the regulation in which the reference appears.

## Guidance

6 The provisions in the Railway Safety Regulations on train protection systems and rolling stock apply to any 'railway', as defined in the Schedule to the Regulations. The special definition of 'railway' in the Schedule (page 15) excludes:

- (a) tramways;
- (b) any street-running part of a railway;
- (c) any part of a railway where driving is by line of sight (ie the maximum speed permitted is such as to enable the driver to stop in the distance they can see ahead in clear weather);
- (d) any part of a railway which is not normally used by fare-paying passengers; and
- (e) any railway on which the line speed is 25 mph or less throughout.

7 Paragraph 6(c) is intended to cover light railway systems which rely on 'line of sight' operation. Where signalling is provided to ensure the safe separation of trains, the Regulations apply, even if permitted speed is low.

8 Paragraph 6(d) refers to parts of a railway not *normally* used by fare-paying passengers. It follows that parts of railways which are only occasionally used by fare-paying passengers are not subject to the Regulations. These include, for example, industrial railways which are used for occasional charters, and goods lines which may be used as a diversionary route for passenger trains in emergency.

9 A number of other words and phrases in the Regulations are defined in regulation 2(1). The following guidance draws attention to some important points. However it is important to study the definitions, and the Regulations and Schedule as a whole, with care.

10 'Infrastructure controller' has the same meaning as in the Railways (Safety Case) Regulations 1994, and is defined there as 'a person who controls railway infrastructure'. Regulation 2(8) of those Regulations provides that a person in control of railway infrastructure is the body in operational control of the infrastructure in the course of the business or undertaking carried on (whether for profit or not) by that body. 'Railway infrastructure' is defined in those Regulations as 'fixed assets used for the operation of a railway including its permanent way and plant used for signalling or exclusively for supplying electricity for operational purposes to the railway' but excluding passenger station buildings.

11 For guidance on regulation 2(2), see paragraph 36(c).

12 Regulation 2(3) makes it clear that regulations 3 and 4 apply to companies who operate trains or rolling stock in the course of a business or other undertaking, whether or not for profit. This includes operations which are run on a voluntary basis, that is without employment or self-employment. (The word 'person' in the Regulations includes 'company'.) It also makes it clear that a self-employed train driver is not an 'operator' for the purposes of these Regulations.

13 For guidance on regulation 2(4), see paragraph 34.

2

## Regulation 3

### Use of a train protection system

#### Regulation

(1) No person shall operate, and no infrastructure controller shall permit the operation of, a train on a railway unless a train protection system is in service in relation to that train and railway.

(2) Until 1 January 2004 it shall be sufficient compliance with paragraph (1) if -

- (a) a programme for the installation and bringing into service of a train protection system in relation to that train and railway has been approved by the Executive and is being implemented; and
- (b) each part of the system which has been brought into service under that programme is maintained in service.

(3) It shall be sufficient compliance with paragraph (1) if the train is being operated on a railway -

- (a) which immediately before the coming into force of this regulation was used (exclusively or not) by London Underground Limited, Tyne and Wear Passenger Transport Executive, Strathclyde Passenger Transport Executive, or Serco Metrolink Limited; and
- (b) in relation to which there is in service equipment which causes the brakes of the train to apply automatically if the train passes a stop signal without authority.

(4) In any proceedings against a person for an offence for contravening paragraph (1) it shall be a defence for that person to prove that -

- (a) at the relevant time the train protection system (or, where paragraph (3) is relied on, the equipment referred to therein) or a relevant part had failed, or had been taken out of service, because of a fault;
- (b) in the case where the fault is in equipment on the train, the train had commenced its journey before the discovery of the fault or is being driven without passengers to a place for the purpose of repair;
- (c) it was not reasonably practicable to remedy the fault sooner; and
- (d) suitable measures had been taken after the discovery of the fault to mitigate the risk of trains colliding or derailling.

(5) In any proceedings against a person for an offence of contravening paragraph (1) in so far as that paragraph relates to having in service in relation to a train on a railway the equipment referred to in the exception in the definition of "train protection system" in regulation 2(1), it shall be a defence for that person to prove that -

- (a) at the relevant time the equipment or a relevant part of it had failed, or had been taken out of service, because of a fault;
- (b) it was not reasonably practicable to remedy the fault sooner; and
- (c) equipment referred to in sub-paragraphs (a) and (b) of that definition was at the relevant time in service in relation to that train and railway.

14 The Regulations require the installation of train protection systems on the track and trains to provide automatic braking in danger situations. The requirement applies to 'railways' and to trains operated on 'railways' - see the Schedule on page 15 for the definition of railway.

15 The requirement is additional to the existing wide-ranging duty in regulation 5 of the Railway Safety (Miscellaneous Provisions) Regulations 1997,<sup>4</sup> which requires infrastructure controllers to ensure, so far as is reasonably practicable, that equipment and procedures are in place for the purpose of preventing collisions between vehicles and with buffer stops, and derailments resulting from excessive speed or incorrectly set points. Infrastructure controllers need to consider this duty and whether it would be reasonably practicable for them to extend their train protection to additional locations, for example to signals at the approach to tunnels, viaducts or long bridges where the potential *consequences* of a collision may be greater than normal, or at other locations where the *risk* of a collision is greater than normal.

16 Regulation 3(1) prohibits the operation of a 'train' on a 'railway' unless a 'train protection system' is in service. The duty to comply is placed on both train operators and infrastructure controllers (see paragraphs 10 and 12 for guidance on these terms).

17 Under the definition of the term in regulation 2(1), 'train protection system' has two meanings:

- (a) where it is reasonably practicable to install it, it means equipment which automatically controls the speed of the train to ensure, so far as possible, that a stop signal is not passed without authority and that the permitted speed is not exceeded at any time throughout its journey; and
- (b) where it is *not* reasonably practicable to install equipment as in paragraph 17(a), it means equipment installed at specified locations which causes the brakes of the train to apply automatically in specified circumstances.

18 Paragraph 17(a) refers to a full automatic train protection (ATP) system which constantly monitors the speed of the train and applies automatic braking whenever necessary, or another system incorporating ATP functionality. Under the Regulations, such a system must be installed where it is reasonably practicable to do so. It is for infrastructure controllers and train operators to decide where the system should be installed. If in doubt, they are advised to consult HSE. However, they should bear in mind that ATP provides more complete protection than the systems envisaged in paragraph 17(b) and that HSE considers that ATP (or a system providing equivalent protection) ought always to be included in new high-speed lines, and be considered in major signalling work. In some cases it might also be reasonable to extend an existing ATP system to other parts of an existing railway.

19 Where it is not reasonably practicable to install ATP, a system conforming to paragraph 17(b) must be installed as a minimum. Guidance on what this involves is given in paragraphs 27 to 41.

20 The requirement to install train protection systems, conforming to paragraph 17(a) or (b) as appropriate, comes into force on 30 January 2000. However, under regulation 3(2) this requirement will be satisfied if a programme for installing and bringing into service train protection systems has been approved by HSE by that date and is being implemented. Responsibility for preparing the installation programme and getting it approved rests with

train operators and infrastructure controllers, who are advised to contact HM Railway Inspectorate without delay. Rolling stock owners, if different from the train operator, may wish to be involved in this process.

21 The installation programme will need to include the following information:

- (a) type of system(s) to be fitted (for example, the train protection and warning system - see paragraph 31);
- (b) the nature and extent of fitment (for example, in the case of the train protection and warning system, what types and numbers of signals, other locations, and trains are to be fitted, and information about which signals will be fitted with a 'train stop' but not a 'speed trap');
- (c) strategy for fitment which explains how this will be prioritised;
- (d) a plan for installing train protection and bringing it into service, with sufficient dated milestones to enable progress to be monitored;
- (e) how implementation of the programme will be monitored; and
- (f) evidence to demonstrate that the programme can be completed by 1 January 2004. This should include estimates of the resources to be made available, information about the proposed contractual arrangements, and information about how work on track and trains will be carried out while maintaining an operational railway.

22 'Approved' is defined in regulation 2(1) as 'approved for the time being'. This means that an approved train protection installation programme may be altered and re-approved - for example, to add detail or make adjustments as the programme progresses - with HSE's agreement or at its initiative.

23 The required train protection systems must be fully in service by 1 January 2004 (regulation 1).

24 Train protection systems and parts of such systems must be maintained in service. This applies both to fully operational systems (regulation 3(1)), and for systems which are being progressively installed and brought into service (regulation 3(2)).

25 'Train' has the same meaning as in section 83(1) of the Railways Act 1993, that is:

- '(a) two or more items of rolling stock coupled together, at least one of which is a locomotive; or
- (b) a locomotive not coupled to any other rolling stock.'

Section 83(1) also defines 'locomotive' as 'any railway vehicle which has the capacity for self-propulsion (whether or not the power by which it operates is derived from a source external to the vehicle)'. It follows that the Regulations apply to self-propelled on-track vehicles. However, the use of trains in engineering possessions without train protection systems may be the subject of an HSE exemption.

26 The provisions on train protection systems apply only on 'railways' as defined in these Regulations (see the Schedule). They do not apply, for example, to railways which have a line speed of 25 mph or less. This excludes most heritage railways.

### Required features of a train protection system

27 The guidance in paragraphs 33 to 41 refers to train protection systems which meet paragraph 17(b), and is therefore *not* relevant to situations where it is reasonably practicable to install the higher level of train protection identified in paragraph 17(a).

28 The definition of train protection system requires that the system should provide automatic braking if a train passes certain red signals without authority, or travels at excessive speed on the approach to certain signals, buffer stops, and speed restrictions. The system comprises equipment on the track and on trains, operating in conjunction with each other. On the track, it will be necessary to install:

- (a) 'train stops' at certain signals; and
- (b) 'speed traps' on the approach to certain signals and speed restrictions, and buffer stops.

29 'Train stops' and 'speed traps' may be essentially similar equipment which provide automatic braking if they detect a train passing a signal at red, or a train travelling too fast on an approach, respectively. More detailed guidance on where train stops and speed traps are required is given in paragraphs 33 to 41.

30 The words 'without authority' occur in paragraph (a)(i) of the definition of 'train protection system'. This allows for the incorporation of a facility which enables the driver to override the protection system if they have been given authority to pass a red signal.

31 The train protection and warning system (TPWS) developed by Railtrack is expected to meet the minimum requirements of the Regulations when suitably installed on track and trains. ATP systems should also be capable of meeting those requirements, as well as the higher requirements which apply in cases where it is reasonably practicable to meet them (see paragraph 17). Infrastructure and trains fitted with train protection systems will be subject to approval by HM Railway Inspectorate (see paragraph 4). HSE will wish to be satisfied that any controls which are provided for isolating failed equipment so as to release the brakes are adequately guarded against casual use and are located away from normal driving controls.

32 More detailed guidance on the locations where the Regulations require train protection systems to be fitted is given in paragraphs 33 to 41. This is based on the definitions of 'train protection system', 'relevant approach', and a number of other words and phrases in regulation 2(1).

### Location of train stops

33 With certain exceptions, train stops must be fitted at those signals which are capable of conveying an instruction to the driver to stop the train, including fixed red signals and stop boards. Under the definitions of 'train protection system' and 'stop signal', and regulation 2(4), train stops are only required at signals where a train passing at red without authority could collide with an oncoming, crossing or converging train. The requirement applies even if the probability of a collision is low - for example at signals where trains are infrequent or because conflicting movements could only occur if a train were delayed.

34 Train stops are not required if a train passing at red would always be diverted away from a possible collision by points, or if there is the possibility

only of a rear-end collision between two trains on the same track (regulation 2(4)). Signals on the approach to emergency crossovers (see paragraph 35), signals used solely for shunting purposes, buffer stops and hand signals are also excluded from the requirement for a train stop. However, speed traps are required on the approach to buffer stops - see paragraph 36(b).

35 Emergency crossovers are normally provided to allow for trains to be crossed from one line to another for single-line working under the supervision of a 'pilotman' when one line is closed to traffic due to engineering work or an emergency (for example an accident). They are usually worked from an adjacent control point, and are not available for use under the normal signalling controls available to the signaller. They are used in accordance with special operating procedures established by the infrastructure controller.

#### **Location of speed traps**

36 Speed traps must be fitted at an approach place on every 'relevant approach', that is:

- (a) on the approach to signals which are required to be fitted with a train stop, with the exceptions described in paragraph 37;
- (b) on the approach to any buffer stop at the end of a passenger platform, ie any platform which may be used by passengers for boarding and alighting;
- (c) on the approach to those speed restrictions where the permitted speed on the approach is 60 mph or more and the speed restriction reduces that speed by at least one-third (for example from 60 mph to 40 mph). This criterion is based on an existing railway group standard on the automatic warning system. Temporary speed restrictions, which are in place for no longer than three months and are used in accordance with special procedures established by the infrastructure controller, are excluded by regulation 2(2).

37 There will be no need to fit a speed trap if the train stop at a signal would alone bring a train travelling at the maximum speed it can attain to a halt before it reaches a position where it could collide with an oncoming, crossing or converging train (see paragraph (a) of the definition of 'relevant approach'). This will apply to certain signals which because of their position cannot be approached at speed; for example, platform starter signals at bay or terminal platforms or signals used only for the reversal of trains through a platform. The maximum attainable speed will have to be low enough and the safety margin beyond the signal large enough, to bring the train to a halt before it can reach the point of danger.

38 Speed traps are required to operate when a train passes at a speed which will prevent it from stopping at the signal or buffer stop or from complying with the approaching speed restriction (see definitions of 'train protection system' and 'excessive speed'). For each speed trap, this requires a calculation to be made of the maximum at which a train could pass the trap and still stop before passing a red signal, striking a buffer stop, or exceeding a speed restriction by more than a specified margin. The speed trap would need to be set to operate if a train passes at any speed higher than that maximum speed.

39 The maximum safe speed will depend in large measure on the distance between the speed trap and the signal, buffer stop or speed restriction. This distance is likely to vary from location to location: speed traps are required to be sited 'at an appropriate place' on the approach, which means siting them at a point which maximises the safety benefit, consistent with practicability.

## Guidance

40 Infrastructure controllers will need to consider the siting and the speed settings of speed traps as part of the engineering development of train protection systems and to bear in mind that the system as a whole will be subject to approval by HM Railway Inspectorate. In some cases it may be possible to use a single speed trap to cover a number of closely spaced signals, or for a speed trap on the approach to a speed restriction also to serve as the speed trap for a signal or signals.

41 Paragraph 38 refers to exceeding a speed restriction by more than a specified margin. Because there may be a slight difference between a train's actual speed and the speed displayed on the driver's speedometer, the Regulations enable HSE to approve margins of tolerance, within which a train travelling at slightly above a speed restriction will be regarded as having complied with that restriction (see paragraph (b) of the definition of 'excessive speed'). The practical effect of this is to allow a speed trap on the approach to a speed restriction to be set so that it will operate only when it is calculated that the speed of the train, when it enters the speed restriction, will exceed the appropriate margin of tolerance. HSE has not yet approved margins of tolerance, but will consider doing so at the appropriate time in the detailed development of the train protection and warning system.

### Other provisions

42 Under regulation 3(3), a number of urban railways which already have protective systems not fully compliant with the definition of train protection system are deemed to comply with the requirement of regulation 3(1). These systems have automatic braking which operates if a train passes a red signal without authority. These railways have a number of features which combine to reduce the risk of collisions, so warranting this special treatment.

43 Regulation 3(4) provides a legal defence which applies when a train protection system develops a fault. Without such a defence, it would be an offence to operate a train, or as an infrastructure controller to permit a train to operate, as soon as the system becomes defective. Regulation 3(4) means that the Regulations will not be contravened provided certain conditions are met:

- (a) the fault must be remedied as soon as reasonably practicable;
- (b) suitable measures must be taken to mitigate the risk (for example by operating at reduced speed or by providing an additional person in the cab); and
- (c) if the fault is in the train's equipment, the train should only be allowed to complete its journey and/or to be driven to a depot for repair.

44 Regulation 3(5) provides an additional legal defence which applies only where full ATP (or an equivalent system) is installed. If the system develops a fault, and the route and trains are also equipped with a functional train protection system which meets the minimum requirements of paragraph 17(b), such as TPWS, trains may continue to operate. It is a condition that the fault must be remedied as soon as practicable.

3

## Regulation 4

### Regulation

4

## Prohibition of Mark I rolling stock

(1) *No person shall operate, and no infrastructure controller shall permit the operation of, any Mark I rolling stock on a railway.*

## Regulation

(2) Paragraph (1) shall not apply to rolling stock which at the relevant time is being exclusively operated other than for the carriage of fare paying passengers or by London Underground Limited, Tyne and Wear Passenger Transport Executive, Strathclyde Passenger Transport Executive or Serco Metrolink Limited.

(3) Until 1 January 2005 paragraph (1) shall not apply to Mark I rolling stock which has been modified so as to ensure that in the event of a collision -

- (a) the underframe of one vehicle will not ride over the underframe of another vehicle so modified (whether or not the other vehicle is part of the same train);
- (b) where sub-paragraph (a) is not practicable, the extent of any such riding over is as small as can practicably be achieved by a modification to the rolling stock.

(4) In this regulation "modified" means modified by the installation of interlocking devices on vehicles and "modification" shall be construed accordingly.

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## Guidance

45 The term Mark I rolling stock is used in the railway industry to describe a series of vehicle types, including both electric and diesel multiple units and locomotive-hauled vehicles, built mainly in the 1960s and 1970s, which share certain characteristics. There is a relatively weak body shell, mounted on a strong structural steel underframe in which most of the vehicle's structural strength is concentrated. This type of rolling stock does not have the crashworthiness of trains built to modern standards, and is likely to suffer far more damage in a collision. There are no safeguards to reduce the likelihood of 'overriding' - where the underframe of one vehicle rides over the underframe of another and may penetrate the passenger space of the other vehicle - and the consequences of overriding are particularly serious in this type of vehicle because of the weakness of the body shell.

46 The definition of 'Mark I rolling stock' in these Regulations covers rolling stock which has a structural underframe with its own longitudinal strength and a passenger compartment which relies mainly on the underframe for its longitudinal strength. This is broadly consistent with past use of the term Mark I rolling stock in the railway industry. However, there are some historical vehicles still in operation which pre-date the Mark I classification in the industry, but which fall within the definition of 'Mark I rolling stock' in these Regulations.

47 Regulation 4(1) prohibits the operation of Mark I rolling stock on a 'railway' (see the Schedule for the meaning of 'railway' in these Regulations). The prohibition comes into force on 1 January 2003 (regulation 1) and is placed on both train operators and infrastructure controllers.

48 Any 'rebodied' rolling stock, ie stock which consists of a new, crash-resistant body shell mounted on a Mark I underframe, will fall outside the definition of 'Mark I rolling stock' because it will have its own longitudinal strength and will no longer rely mainly on the longitudinal strength of the underframe. It follows that if Mark I stock is rebodied before 1 January 2003, regulation 4 will be satisfied. The Regulations place no time limit on the operation of rebodied stock.

49 Under regulation 4(3), any rolling stock which is modified in the way specified in regulations 4(3) and (4) (see paragraph 50) can be operated until 1 January 2005. The modifications must be carried out before 1 January 2003, unless the rolling stock is withdrawn from service before that date pending modification. To comply with regulation 4(1), any modified vehicles should be withdrawn or rebodied before 1 January 2005.

4

## Guidance

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50 The modifications which are necessary to permit Mark I rolling stock to continue in operation until 1 January 2005 are interlocking devices on vehicles which ensure that in the event of a collision there is no 'overriding' (see paragraph 45) or as little overriding as can practicably be achieved. This means that the most effective anti-overriding modifications available must be carried out. Currently, these are considered to be the recently-developed 'cup and cone' anti-override device and associated modifications, whose effectiveness in eliminating or greatly reducing overriding in end-to-end collisions has been demonstrated in work and tests carried out on behalf of HSE. Details of the 'cup and cone' concept are available from HM Railway Inspectorate.

51 Under regulation 4(2) the prohibition on Mark I rolling stock does not apply to rolling stock which is:

- (a) carrying no fare-paying passengers; or
- (b) operated by London Underground Limited, Tyne and Wear Passenger Transport Executive, Strathclyde Passenger Transport Executive, or Serco Metrolink Limited.

52 The provisions on Mark I rolling stock apply only to stock which is operated on a 'railway' as defined in these Regulations (see the Schedule). They do not apply, for example, to rolling stock which is operated on a railway which has a line speed of 25 mph or less. This excludes most heritage railways.

## Regulation 5

### Regulation

5

*(1) No person shall operate, and no infrastructure controller shall permit the operation of any rolling stock on a railway if the rolling stock has hinged doors for use by passengers for boarding and alighting from the train (other than doors which have a means of centrally locking them in a closed position).*

*(2) Paragraph (1) shall not apply to rolling stock which at the relevant time is being exclusively operated other than for the carriage of fare paying passengers.*

53 Regulation 5(1) prohibits the operation of rolling stock which has hinged doors without central locking (sometimes known as 'slam door' stock) on a 'railway' - see the Schedule for the meaning of 'railway' in these Regulations. The prohibition applies from 1 January 2005 (regulation 1), and is placed on both train operators and infrastructure controllers. Under regulation 5(2), the prohibition does not apply to rolling stock when it is carrying no fare-paying passengers.

54 Most rolling stock which has hinged doors without central locking falls within the definition of Mark I rolling stock, which is required by regulation 4 to be withdrawn or rebodied by 1 January 2005. However there are a number of non-Mark I vehicles which have these doors. These vehicles will have to be withdrawn, rebodied, or to have central locking installed before 1 January 2005 if they are to continue to operate on a 'railway' (see paragraph 55).

55 The provisions on hinged-door rolling stock apply only to stock which is operated on a 'railway' as defined in these Regulations (see the Schedule). They do not apply, for example, to rolling stock which is operated on a railway which has a line speed of 25 mph or less. This excludes most heritage railways.

5

## Regulation 6

### Regulation

6

## Exemption certificates

(1) *The Executive may, by certificate in writing, exempt any person or class of persons, railway, part of a railway or class of railways, train or rolling stock, or class of train or rolling stock from any prohibition imposed by these Regulations and any such exemption may be granted subject to conditions and to a limit of time and may be revoked by a certificate in writing at any time.*

(2) *Before granting an exemption the Executive shall consult such persons as it considers appropriate.*

(3) *In deciding whether to grant any such exemption the Executive shall have regard to -*

- (a) *the conditions, if any which it proposes to attach to the exemption;*
- (b) *any other requirements imposed by or under any enactment which apply to the case;*
- (c) *all other circumstances of the case.*

### Guidance

6

56 Regulation 6 gives HSE a wide power to grant exemptions from any of the prohibitions in the Regulations on operating (or allowing the operation of) trains without a train protection system, Mark I rolling stock, or stock with hinged doors without central locking. Exemptions must be in the form of a written certificate. They may be subject to a time limit and/or conditions. An exemption may relate to a specific duty holder or a specific railway (or part of a railway), train or rolling stock; or it may relate to 'classes': for example, it may apply to any duty holder, railway, etc which meets specified criteria.

57 Before granting an exemption HSE is required by regulation 6(2) to consult such persons as it considers appropriate. These may include relevant train operators, infrastructure controllers, rolling stock owners, trade unions, rail user consultative committees, and rail regulators. In deciding whether to grant an exemption, HSE is required to have regard to the conditions to be attached to the exemption, any other relevant legal requirements, and all other circumstances of the case. Although regulation 6 provides for an exemption to be withdrawn at any time, HSE will not normally revoke an exemption unless there has been a material change of circumstances warranting such action.

58 Any duty holder wishing to request an exemption should write to HM Railway Inspectorate at the address given in paragraph 4. The request should explain:

- (a) what exemption is requested, and whether an indefinite or a time-bound exemption is sought;
- (b) the reasons for requesting exemption;
- (c) any alternative safety measures proposed; and
- (d) an assessment of the risk compared with the risk which would prevail if the Regulations were complied with.

59 All requests for exemption will be acknowledged and applicants will be notified of HSE's decision and reasons for any rejection as soon as possible after the necessary consultations have been carried out. All correspondence, including HSE's decision and the reasons for it, will be placed in the public domain along with exemption certificates. A similar procedure will apply in respect of any exemptions which HSE decides to grant without an application having been made.

## Guidance

60 Where part of a railway is under engineering possession, it may be necessary to suspend normal signalling arrangements. HSE proposes to consult appropriate parties with a view to granting an exemption, subject to conditions, to enable trains to operate in engineering possessions without a train protection system being in operation. HSE will also consider an exemption to allow trains to operate without a train protection system in cases where special working arrangements, such as 'temporary block working' or 'working by pilotman', have been put in place following a signalling failure.

61 Most heritage railways fall outside the definition of 'railway', and hence are excluded from the provisions on train protection systems, Mark I rolling stock and hinged-door rolling stock because their line speed is 25 mph or less throughout. HSE will consider whether to exempt, subject to conditions, the small number of heritage railways which operate at a slightly higher line speed.

62 HSE will also consider whether to grant exemptions to allow excursions using Mark I rolling stock where the 'heritage' nature of the carriage is an essential part of the travelling experience. Any such exemptions are likely to be from regulations 4 and 5 (Mark I rolling stock and hinged-door rolling stock) and are unlikely to be granted from regulation 3 (train protection systems). Conditions may be set requiring modifications to be made, specific marshalling and formation rules to be followed, and/or operational limitations to be adhered to on, for example, operating speed, physical separation from other trains, and measures to reduce the risk of doors being opened when the train is in motion.

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## Regulation 7

### Regulation

*In Part IV of Schedule 2 to the Reporting of Injuries, Diseases and Dangerous Occurrences Regulations 1995<sup>(a)</sup> paragraph 72(1)(b) and (2), and the word "or" in paragraph 72(1)(a) shall be deleted.*

(a) SI 1995/3163

7

## Amendments

### Guidance

63 Regulation 7 makes an amendment to the Reporting of Injuries, Diseases and Dangerous Occurrences Regulations 1995 (RIDDOR)<sup>5</sup> concerning the duty to report to HSE incidents of 'signals passed at danger' (SPADs).

64 Currently, SPADs which occur in circumstances where a train protection system was in operation do not have to be reported. As from 1 April 2000 (regulation 1), these will have to be reported in the same way as other SPADs. This change will ensure that as train protection systems become more widespread, information on SPADs resulting from driver error will continue to be reported to HSE, whether or not a train protection system is fitted. This will capture SPADs to which a failure of a train protection system may have contributed, as well as those where the system operated and reduced the consequences of an error.

65 SPADs which occur when a red signal is shown too late for the driver to stop - often resulting from minor faults which cause signalling systems to 'fail safe' by automatically switching signals to red - continue to be excluded from the reporting requirements.

7

## The Schedule

### Meaning of railway

#### Regulation 2(1)

1 "Railway" means a system of transport employing parallel rails which provide support and guidance for vehicles carried on flanged wheels and form a track which either is of a gauge of at least 350 millimetres or crosses a carriageway (whether or not on the same level), except that it does not include -

- (a) a tramway;
- (b) any part which runs along and at the same level as a street or in any other place to which the public has access (including a place to which the public has access only on making a payment);
- (c) any part where the permitted speed is such as to enable the driver to stop the train in the distance he can see ahead in clear weather conditions;
- (d) any part normally used other than for the carriage of fare paying passengers; or
- (e) such a system if on no part of it there is a line speed exceeding 25 miles per hour.

2 In this Schedule -

"carriageway" has the same meaning as in the Highways Act 1980<sup>(a)</sup> or in 'Scotland, the Roads (Scotland) Act 1984<sup>(b)</sup>;

"street" means -

- (a) in England and Wales, a street within the meaning of section 48 of the New Roads and Street Works Act 1991<sup>(c)</sup>, together with land on the verge of a street or between two carriageways;
- (b) in Scotland, a road within the meaning of section 107 of the New Roads and Street Works Act 1991, together with land on the verge of a road or between two carriageways;

"tramway" means a system of transport used wholly or mainly for the carriage of passengers and employing parallel rails which -

- (a) provide support and guidance for vehicles carried on flanged wheels;
- (b) are laid wholly or mainly along a street or in any other place to which the public has access (including a place to which the public has access only on making a payment);

"vehicle" includes a mobile traction unit.

(a) 1980 c. 66.

(b) 1984 c. 54.

(c) 1991 c. 22.