Rail Industry Standard
RIS-3437-TOM
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Defective On-Train Equipment

Synopsis

This document contains requirements relating to the production of contingency plans, which items of on-train equipment they are to include and the type of arrangements to be applied when they become defective.

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Issue Record

Issue	Date	Comments
One	03/12/2016	Replaces Railway Group Standard GORT3437 issue eight as it could not be retained as a National Safety Rule and is therefore reclassified as a Rail Industry Standard.
Two	01/09/2018	Replaces issue one. Merges RIS-3437-TOM issue one with GOGN3637 issue two in line with the Strategy for Standards. A number of requirements, including those relating to AWS, TPWS and DSD, were amended following a series of industry risk workshops.
Three	03/09/2022 [Proposed]	Replaces issue two. A number of sections were amended, including: DSD, HABD, doors, OTDR, sanding equipment, wheel flats and guidance on fire suppression.

Revisions have been indicated with a vertical black line in this issue.

Superseded Documents

The following Railway Group documents are superseded, either in whole or in part as indicated:

Superseded documents	Sections superseded	Date when sections are superseded
RIS-3437-TOM issue two Defective On-Train Equipment	All	03/09/2022 [Proposed]

Supply

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Part 1 Purpose and Introduction

1.1 Purpose

1.1.1 This document is a standard on defective on-train equipment (DOTE) contingency plans.

1.1.2 Application of this document can be considered as providing:

a) A 'code of practice' to address a safety hazard when applying the common safety method for risk evaluation and assessment (CSM RA) or other suitable and sufficient risk assessment approach.
b) A common application of a risk management or assessment approach.
c) An agreed approach for two or more industry parties to cooperate, coordinate and collaborate.
d) A common approach to discharge specific legal obligations.
e) A common approach which provides economic or other benefits across the industry.

1.1.3 This document sets out requirements and provides guidance to assist the development of contingency plans and alternative controls to assist with complying with fundamental operational principle 7, hazards to safe operation from unsafe trains, of the Operational Concept for the GB mainline railway (RSSB-GBMR-OC).

1.1.4 This document should be read in conjunction with The Railways and Other Guided Transport Systems (Safety) Regulations 2006 (as amended) (ROGS), the Railway Safety (Miscellaneous Provisions) Regulations 1997 and the Railway Safety Regulations 1999.

1.2 Background

1.2.1 The Operation and Traffic Management National Technical Specification Notice (OPE NTSN) requires railway undertakings (RUs) to have processes in place to ensure that safety-related on-train equipment is functional and that a train is fit to run. It also requires that transport operators must define and keep up to date conditions and procedures for trains running in degraded mode. The Rule Book (GERT8000) module TW5 'Preparation and movement of trains: Defective or isolated vehicles and on-train equipment' provides a framework of conditions of travel for trains with defective equipment. However, this often requires the railway undertaking to provide event-specific instructions. This standard will help railway undertakings meet the requirements of the OPE NTSN and it aligns with the rules set out in Rule Book module TW5.

1.3 Principles

1.3.1 The aim of DOTE contingency arrangements is to minimise the detrimental effect on network safety and performance of a train remaining stationary for a prolonged period.

1.3.2 The OPE NTSN requires the infrastructure manager and railway undertaking to have processes in place to immediately inform each other of any situation that will impede

the normal running of a train. See GOGN3615 'Rail Industry Guidance Note for the Operation and Traffic Management Technical Specification for Interoperability'.

1.3.3 The Rule Book (GERT8000) contains rules for dealing with defective on-train equipment. Not all items of on-train equipment shown in Part 4 have related requirements in the Rule Book: some equipment, such as automatic train protection (ATP), is not in general use and therefore not included in the Rule Book.

1.3.4 If a driver contacts a controller or rolling stock technician directly for advice on dealing with a defect, these staff need to take care that they do not instruct the driver to make any movement not authorised by the signaller. If necessary these staff may need to remind the driver to seek authority for the movement from the signaller.

1.3.5 There is also a possibility that a rolling stock technician might request that the defective train is dealt with in a way that is different to the DOTE contingency arrangements.

1.4 Scope

1.4.1 This document applies to defective on-train equipment shown in Part 4 when the train or vehicle is on or about to enter the GB mainline railway. Railway undertakings may choose to include in their contingency plan equipment included in Part 5 and any additional equipment which is not shown in Parts 4 or 5.

1.5 Application of this document

1.5.1 Compliance requirements and dates have not been specified because these are the subject of internal procedures or contract conditions.

1.5.2 If you plan to do something that does not comply with a requirement in this RIS, you can ask a Standards Committee to comment on your proposed alternative. If you want a Standards Committee to do this, please submit your deviation application form to RSSB. You can find advice and guidance on using alternative requirements on RSSB's website www.rssb.co.uk.

1.6 Health and safety responsibilities

1.6.1 Users of documents published by RSSB are reminded of the need to consider their own responsibilities to ensure health and safety at work and their own duties under health and safety legislation. RSSB does not warrant that compliance with all or any documents published by RSSB is sufficient in itself to ensure safe systems of work or operation or to satisfy such responsibilities or duties.

1.7 Structure of this document

1.7.1 This document sets out a series of requirements that are sequentially numbered. This document also sets out the rationale for the requirement, explaining why the requirement is needed and its purpose and, where relevant, guidance to support the requirement. The rationale and the guidance are prefixed by the letter 'G'.

1.7.2 Some subjects do not have specific requirements but the subject is addressed through guidance only and, where this is the case, it is distinguished under a heading of 'Guidance' and is prefixed by the letter 'G'.

1.8 Approval and Authorisation

1.8.1 The content of this document will be approved by Traffic Operation and Management Standards Committee on 28 June 2022 [proposed].

1.8.2 This document will be authorised by RSSB on 29 July 2022 [proposed].

Part 2 Requirements of Railway Undertakings

2.1 Identifying defects

2.1.1 A railway undertaking shall have a system for identifying vehicles with defective on-train equipment and arranging for rectification of the defect or restricted operation until rectification can be achieved.

Rationale

G 2.1.2 These are requirements of the OPE NTSN and LOC & PAS NTSN for the running of trains.

Guidance

G 2.1.3 The Rule Book (GERT8000) module TW1 'Preparation and movement of trains' gives details of some preparation duties which would allow some defects, such as lack of brake continuity, to be identified before a train starts a journey. Maintenance procedures and schedules may set out frequencies for testing of other equipment which would allow defects to be detected.

G 2.1.4 For some items of equipment, a defect will be obvious to the driver or train preparer either immediately or after a short period of time or distance travelled. For other items, a defect may only be identified when rarely operated equipment is used or may only be apparent to passengers.

2.2 Content of DOTE contingency plan

2.2.1 General arrangements

2.2.1.1 DOTE contingency arrangements shall detail the action to be taken when any item of on-train equipment set out in Part 4 becomes defective.

Rationale

G 2.2.1.2 The purpose of a contingency plan is to set out the appropriate actions to take to mitigate risks associated with defective on-train equipment. Equipment that has an interaction with, or is likely to have an impact on the railway infrastructure or other trains operating on it, is to be included in the DOTE contingency plan.

Guidance

G 2.2.1.3 Railway undertakings may consider including in their DOTE contingency plan any other items of on-train equipment that could affect the operation of a train or its ability to complete its journey.

G 2.2.1.4 Considerations when formulating the DOTE contingency plan may include, but are not necessarily limited to:

a) Risks associated with the train’s movement.

b) The most appropriate way of dealing with the train, taking account of the ability to safely move the train and risks to passengers resulting from further movement, premature termination or cancellation.
c) Potential for delay and cancellation of services.
d) Delay and risk to following and subsequent trains.

2.2.2 Identification of maintenance depots

2.2.2.1 The DOTE contingency plan shall identify all items of on-train equipment, included in the plan, that can be repaired or replaced at each maintenance depot for all classes of rolling stock used by the railway undertaking.

Rationale

G 2.2.2.2 Readily available information on where equipment on different classes of train can be repaired enables control staff to make informed decisions and ensures that defective trains are sent to an appropriate location.

Guidance

G 2.2.2.3 Some requirements in this document refer to 'starting a journey from a maintenance depot'. If a train is starting a journey from a depot, but one that is not equipped to deal with the type of train or defect in question, then the train may be considered not to be at a maintenance depot for the purposes of these requirements.

2.2.3 Locations where trains can be dealt with

2.2.3.1 The DOTE contingency plan shall indicate the locations where a train or vehicle, which has been permitted to start a journey with defective on-train equipment, or on which on-train equipment has become defective during a journey, may be:

a) Turned.
b) Taken out of service.
c) Repaired.
d) Examined by a rolling stock technician.
e) Remarshalled.

Rationale

G 2.2.3.2 Readily available information on where trains can be turned, remarshalled and repaired enables control staff to make informed decisions and ensures that defective trains are dealt with as expeditiously as possible.

Guidance

G 2.2.3.3 Although it is desirable to turn a train at the earliest possible opportunity to allow it to be driven from a cab without the defect, in some situations further reversals and changes of cab may be required to reach a maintenance depot at which the defect can be dealt with. The objective of the DOTE contingency plan is to reduce to the minimum the overall distance the train is to be driven from the cab with the defective equipment.

G 2.2.3.4 The formulation of a DOTE contingency plan takes into account likely traffic levels and associated risk levels. For some on-train defects, it could be appropriate to plan for different arrangements to apply on lines identified as lightly used, as opposed to lines with a frequent service level. The recommendations for specific defects shown in Parts 4 and 5 set out examples of when such differences might be applicable.

2.2.4 Exceptional circumstances

2.2.4.1 Where a railway undertaking finds that it is not possible to follow the DOTE contingency plan due to exceptional circumstances, the railway undertaking and the infrastructure manager shall discuss and document alternative arrangements. Alternative arrangements shall not conflict with the contents of GERT8000-TW5 in respect of the automatic warning system (AWS), European Rail Traffic Management System (ERTMS), train protection warning system (TPWS) or ATP equipment.

2.2.4.2 The likely effects of exceptional weather on alternative transport arrangements are to be considered and included in the DOTE plan.

Rationale

G 2.2.4.3 The arrangements for AWS, ERTMS, TPWS and ATP are not to be varied due to the change in safety risk when these systems are not operative. There are also legal restrictions on operating trains without some of these systems.

G 2.2.4.4 Exceptional weather conditions are likely to affect the assumptions made about alternative transport arrangements used in the DOTE contingency plan.

Guidance

G 2.2.4.5 Weather is not the only cause of exceptional circumstances but other causes by their nature are likely to be unpredictable and difficult to foresee.

G 2.2.4.6 Flooding, heavy snowfall, extreme temperatures and strong winds are some of the exceptional weather conditions that may need to be considered.

G 2.2.4.7 In exceptional circumstances, the balance of risk between continuing in service with the defect and the consequences of cancelling or reducing the capacity of the train may need to be taken into consideration and documented.

G 2.2.4.8 Such circumstances may include:

a) Where the train involved is the first train in the morning and its cancellation would seriously affect the ability to operate other services.
b) Where the train involved is the last train at night and no alternative train service is available.
c) Equipment becoming defective where it is not possible to make alternative transport arrangements for the passengers affected – special operating conditions may have to be applied in such circumstances, such as speed restrictions or arranging with the signaller to block other lines or set routes earlier or later than normal.
d) Where public disorder may result in a level of risk greater than that resulting from allowing the train to continue in service.

e) Alterations to elements of the DOTE contingency plan, for example, unforeseen reduction of staffing levels at a station defined in the plan as suitable for detraining.
f) Where crowding in trains or on stations is at such a level it is likely to create a serious safety incident.

2.2.5 Impact of a train not performing a planned journey

2.2.5.1 The DOTE contingency plan shall take account of the operational impact of the train or unit not making a journey as planned, for example:

a) Cancellation of train services, especially the last train and on lines with infrequent services.
b) Overcrowding of trains and station platforms.
c) Increased station dwell times.
d) The planned diagram for the vehicle or unit before the defect can be repaired.

Rationale

G 2.2.5.2 For some defects the risks from overcrowding and/or necessity for passengers to change platforms may be greater or comparable to allowing the train to operate.

G 2.2.5.3 Cumulative additional station dwell time could result in the loss of train path and considerable delay to following services.

Guidance

G 2.2.5.4 On a long journey with few stops, the effect of additional station dwell time may not be significant. Conversely, where there are frequent stops, especially on crowded trains, the cumulative effect may be a significantly extended journey time. If consideration is given to cancelling the train, the likely effects on station dwell time on the next service should also be taken into account.

2.2.6 Stations suitable for detraining passengers

2.2.6.1 The DOTE contingency plan shall identify stations suitable for detraining passengers from a train or vehicle with defective on-train equipment and stations that are not suitable for detraining passengers.

2.2.6.2 The suitability of any selected station for detraining passengers shall have been accepted by the station infrastructure manager before the railway undertaking submits a draft DOTE contingency plan to the infrastructure manager responsible for managing the network.

2.2.6.3 When a vehicle develops other specified defects, this document and Rule Book module TW5 require that passengers are detrained at the next station, even if this is not a designated suitable station. However, a small number of stations are not suitable for detraining passengers in any circumstances and these should be identified in the DOTE plan.

Rationale

G 2.2.6.4 When a vehicle develops certain defects, passengers are to be detrained before the train reaches its intended destination. Suitable stations are ones which have been assessed as having appropriate facilities for dealing with detrained passengers.

Guidance

G 2.2.6.5 The actions required for each specific defect are set out in the section applicable to that item of equipment.

G 2.2.6.6 In determining the suitability of a station for detraining passengers, transport operators may take the following non-exhaustive list of factors into account:

a) The potential number of passengers involved.
b) The means of controlling and maintaining the safety of the detrained passengers.
c) Provision of facilities for persons with disabilities.
d) Waiting facilities, including the provision of refreshments and toilet facilities.
e) Ratio of number of staff to the number of passengers likely to be detrained.
f) Communication facilities, for example, mobile phone reception, wireless internet access and the availability of public telephones.
g) Platform length able to accommodate the length of the train if the train does not have a continuous gangway.

G 2.2.6.7 If a station would not be considered suitable because the waiting facilities are inadequate, but a train would be able to remain in the station with passengers aboard until alternative transport is available, then it may be possible to include it as a suitable station.

G 2.2.6.8 A station may be considered unsuitable for detraining passengers where:

a) The platform area is inadequate to accommodate all the passengers from a single train.
b) The protection from the elements would be insufficient to accommodate the number of passengers likely to be detrained.
c) Road access is unsuitable for the dispersal of passengers by road transport if necessary.

2.3 Consulting on DOTE plans

2.3.1 Railway undertakings shall share a copy of their DOTE contingency plan, both drafts and current, with:

a) The infrastructure manager responsible for the railway line.
b) Infrastructure managers responsible for stations where a DOTE contingency plan states that they are suitable for passenger detrainment.
c) Infrastructure managers responsible for stations that are not suitable for passenger detrainment.
d) Any transport operators or organisations affected by the implementation of a DOTE contingency plan.

Rationale

G 2.3.2 It is beneficial for affected parties to have the opportunity to be aware of any implications and additional responsibilities that a DOTE contingency plan may place upon them and to have the opportunity to comment before the plan is finalised.

Guidance

G 2.3.3 It is good practice to keep a record of which organisations were supplied with draft and current copies of the DOTE contingency plan and any comments received.

2.4 Monitoring, review and revision of DOTE contingency plans

2.4.1 Monitoring

2.4.1.1 Railway undertakings shall monitor the effectiveness of their DOTE contingency plan to identify any shortcomings and improve the plan as necessary.

Rationale

G 2.4.1.2 Monitoring the effectiveness of DOTE contingency plans allows deficiencies to be identified and changes to be implemented as quickly as possible.

Guidance

G 2.4.1.3 Joint reviews with affected parties of the effectiveness of DOTE contingency plans is recommended.

G 2.4.1.4 This review may include staff who have direct experience in implementing the DOTE contingency plan.

2.4.2 Review due to change

2.4.2.1 Railway undertakings shall review their DOTE contingency plan when changes are to be made to:

a) The type of on-train safety systems normally required to be operative on a route.
b) Routes over which the railway undertaking operates.
c) The infrastructure.
d) The train service pattern, the level of service or the calling pattern.
e) The rolling stock fleet.
f) The rolling stock used on the route by another railway undertaking.
g) On-train equipment.
h) Rolling stock maintenance arrangements that affect maintenance locations.
i) Facilities, either temporary or permanent, at stations identified for the detraining of passengers in a DOTE contingency plan.
j) Operational circumstances such as changes to staffing arrangements including competencies.
k) Relevant operational documentation such as GERT8000-TW5.

Rationale

G 2.4.2.2 Changes to infrastructure or facilities may mean that the arrangements contained in the DOTE contingency plan can no longer be implemented; in this situation the plan will need to be updated.

G 2.4.2.3 The DOTE contingency plans need to be reviewed when operational changes are made to ensure that it remains relevant and continues to indicate the best course of action for any specific defect.

Guidance

G 2.4.2.4 A plan for the introduction of changes to the DOTE plan could be used to assist the implementation of the revised DOTE plan.

G 2.4.2.5 Technical updates to rolling stock are considered when this affects their compatibility with other stock.

G 2.4.2.6 Changes to the fleets used by other railway undertakings may affect the ability to provide mutual train assistance or position a defective cab intermediately in a train. Changes to rolling stock may also affect the ability of some trains to call at stations which might affect some of the assumptions made about alternative services when selecting stations at which trains are to be taken out of service.

Part 3 Responsibilities of Infrastructure Managers and other Transport Operators

3.1 Infrastructure managers to comment on DOTE contingency plans

3.1.1 The infrastructure manager shall review and comment on draft DOTE contingency plans submitted to them by railway undertakings.

3.1.2 Infrastructure managers shall confirm whether or not a nominated station is suitable for detraining passengers from defective trains.

3.1.3 Infrastructure managers shall inform the railway undertaking if, following the review of their DOTE contingency plan, they conclude that it can accept the plan without comment.

Rationale

G 3.1.4 Infrastructure managers need to understand their own responsibilities contained within a DOTE contingency plan and decide if they would be adversely affected.

Guidance

G 3.1.5 Infrastructure managers may wish to check:

a) Consistency with the contents of the Sectional Appendix (where relevant).
b) Procedures in the plan comply with the requirements of this document or that there is evidence that alternative arrangements are likely to control the risks to an equivalent or lower level.

3.2 Infrastructure managers to inform railway undertakings of changes to infrastructure

3.2.1 Infrastructure managers shall inform railway undertakings of any infrastructure changes that may impact on DOTE contingency plans.

Rationale

G 3.2.2 Advice to railway undertakings of changes to infrastructure and facilities enables the content of a DOTE plan to be reviewed and, if necessary, changed.

Guidance

G 3.2.3 Changes to infrastructure and facilities may include:

a) The length or width of platforms.
b) The number of available platforms.
c) Restrictions or changes to footbridges or subways.
d) Restrictions or changes to covered areas where passengers could wait.
e) Restrictions or changes to the station entrances, including those outside the station that affect access.
f) Changes to the operative areas of safety systems such as ATP, AWS, ERTMS, or TPWS.

G 3.2.4 Some of these changes are within the remit of the 'Network Change' process. However, this is not likely to include changes to station facilities.

Part 4 Equipment to be included in the DOTE Contingency Plan

4.1 Air suspension

4.1.1 A train shall not start a journey from a maintenance depot if the air suspension is not inflated on any bogie.

4.1.2 A train shall not start a journey from other than a maintenance depot, or continue its journey, if the air suspension is not inflated on any bogie, other than in accordance with any route clearance restrictions and speed restrictions imposed by company instructions.

Rationale

G 4.1.3 The potential reduced ride height of vehicles with deflated air suspension can affect the kinematic envelope and therefore their route clearance, especially in relation to station platforms and similar infrastructure. Speed restrictions or even prohibition may be necessary at some locations to allow safe operation.

G 4.1.4 Poor ride quality with deflated air suspension may lead to a railway undertaking imposing speed restrictions for passenger comfort.

Guidance

G 4.1.5 Gauge and speed restrictions imposed by a certificate of gauging authority, statement of compatibility, Sectional Appendix and company instructions are normally taken into consideration when deciding when and how the vehicle will be worked to a maintenance depot.

4.2 Automatic dropping device (ADD)

4.2.1 General

4.2.1.1 Trains shall not start a journey from a maintenance depot if an ADD is not operative when it is intended that the pantograph will be used.

4.2.1.2 If a train is allowed to leave a maintenance depot with a restriction on the use of a pantograph, there shall be a process that ensures drivers are aware of this.

Rationale

G 4.2.1.3 If the ADD is isolated, damage to the pantograph head which could affect its safe interaction with the contact wire will not be automatically detected.

G 4.2.1.4 If there is damage to the pantograph head which could affect its safe interaction with the contact wire, damage may be caused to the overhead line equipment (OLE) or a de-wirement.

Guidance

G 4.2.1.5 The performance and range of a train may be affected if it is released with a restriction on the use of a pantograph.

G 4.2.1.6 Some trains have more than one pantograph but only operate with one raised (Class 390 is an example of this). Dual AC/DC units could still operate in DC mode. Bi-mode trains could operate in the non-electric mode, but if this significantly affects their performance on electrified lines they may need to be restricted to operating on non-electrified lines.

4.2.2 Speed limitation

4.2.2.1 A train which has a raised pantograph on which the ADD has been isolated, because it started a journey from other than a maintenance depot with an ADD isolated or an ADD was isolated during a journey, shall not exceed 100 mph.

Rationale

G 4.2.2.2 Although all AC traction units are now required to be provided with an ADD, historically units with a maximum speed of 100 mph or lower were not required to have an ADD. Consequently, when the ADD has been isolated, speed has been reduced to the maximum permitted for traction units without an ADD.

G 4.2.2.3 The greater the speed, the greater the potential to cause damage to the OLE if the pantograph becomes damaged but does not lower. A maximum speed of 100 mph without an operative ADD is a compromise between the reduction in train performance and the increased risk of OLE damage.

G 4.2.2.4 When ADDs were initially provided, the majority of the AC fleet was not fitted with them. Therefore, if the ADD was isolated on an ADD fitted unit, it was not necessary to impose a restriction that would not apply to an unfitted unit. If a train is operating with a pantograph raised and the ADD isolated, there is the possibility that the pantograph could subsequently become damaged but remain undetected.

Guidance

G 4.2.2.5 There are some recorded cases where an ADD has been isolated and the train has subsequently been involved in an incident in which the OLE has been brought down shortly thereafter. It has not been possible to conclude whether any damage that had resulted in isolation of the ADD was a contributory factor in the subsequent de-wirement. The maximum speed of 100 mph with an ADD isolated is a historic practice and cannot be fully justified on a risk basis. However, there is not sufficient evidence to justify a lower speed limit.

G 4.2.2.6 As the amount of OLE damage in the event of a de-wirement incident can be affected by the time taken for the train to come to a stand, the RU may wish to impose a speed restriction lower than 100 mph. This may be particularly applicable if a particular class of traction unit or location is prone to de-wirement incidents or the OLE is of headspan construction, where any damage is likely to affect more than one line.

G 4.2.2.7 To avoid causing cancellations or short formations, a train on which the ADD has been isolated may complete its journeys for the remainder of the day but it is recommended that its final journey is to a maintenance depot.

4.3 Automatic power change over (APCO)

4.3.1 A train shall not start a journey from a maintenance depot if it is known that an APCO system is not working when it will be required to be used.

4.3.2 A train can start or continue a journey from other than a maintenance depot with an APCO system not working provided the driver is able to change power systems manually and a work load assessment has concluded that this would be a reliable method of operation. The final journey of the day shall be to a maintenance depot.

4.3.3 If the driver cannot manually change power systems, the train shall either operate only in self-powered mode or be restricted to an electrified area.

Rationale

G 4.3.4 If a train fails to change over its power system automatically and lower its pantographs before leaving an area of OLE, it may suffer damage and cause delay.

Guidance

G 4.3.5 The performance and range of a train may be affected if it is only able to operate in self-powered mode.

4.4 Automatic train protection (ATP)

4.4.1 In an area where ATP is provided, a train fitted with ATP shall not start a journey conveying passengers if ATP is inoperative in any cab which is required to be used.

4.4.2 If ATP becomes defective on a train during a journey, provided that the line is fitted with AWS and TPWS and both systems are working on the train, it may complete its journey, subject to any speed restrictions that apply to non-ATP fitted trains.

4.4.3 If ATP becomes defective on a train during a journey and AWS or TPWS is not working, the train shall be subject to the arrangements for defective AWS or TPWS, set out in the relevant sections for these systems.

Rationale

G 4.4.4 ATP provides an important safety supervisory function, particularly where signalling overrun distances (overlaps) are short.

G 4.4.5 If the ATP system is not available on a train, arrangements to rectify this or withdraw the train from service are required as soon as possible.

Guidance

G 4.4.6 In some locations, trains fitted with operative ATP are permitted to operate at higher speeds.

G 4.4.7 Instructions to train drivers and other staff involved in dealing with defective ATP equipment are published in the Sectional Appendices applicable to the routes on which ATP is installed.

4.5 Automatic warning system (AWS)

4.5.1 Starting a journey from a maintenance depot

4.5.1.1 A train shall not start a journey from a maintenance depot if in any cab which it is to be driven from when AWS is required to be in operation:

a) The AWS is defective.
b) The AWS is isolated.
c) The seal is broken on an AWS isolating handle.

Rationale

G 4.5.1.2 AWS provides an important safety function. It can act as a reminder to the driver that the train is approaching a restrictive signal or a location where speed is restricted. It is especially important in conditions of poor visibility where it can also assist the driver in determining locations when the usual visual clues are difficult to observe.

Guidance

G 4.5.1.3 RSSB analysis shows that the probability of a signal passed at danger (SPAD) is between three and 10 times greater if AWS is not available.

G 4.5.1.4 A broken seal may indicate a fault with the AWS equipment.

4.5.2 Starting a journey from other than a maintenance depot or during a journey

4.5.2.1 On trains where AWS is defective, isolated or the seal is broken on the isolating handle, in situations other than starting a journey from a maintenance depot, arrangements shall be made as shown in the table below:

	Line without ERTMS or ATP	Line where ERTMS is in operation	Line where ATP is provided
Train to start a passenger journey	Not permitted	Permitted if ERTMS is working in the cab being driven from. Not to enter a line where AWS is required to be in operation	Permitted if ATP is working in the cab being driven from. Not to enter a line where ATP is not provided
Train to start a journey not carrying passengers	Permitted to travel to a maintenance depot. Conditions for 'During a journey' apply (see below)	Permitted if ERTMS is working in the cab to be driven from. Permitted to leave the ERTMS area to travel to a maintenance depot	Permitted if ATP is working in the cab being driven from. Permitted to leave the ATP area to travel to a maintenance depot

	Line without ERTMS or ATP	Line where ERTMS is in operation	Line where ATP is provided
During a journey	Freight trains and OTMs are not to exceed 80 km/h (50 mph) all other trains are not to exceed 95 km/h (60 mph) unless a competent person is provided. A competent person shall be provided as soon as possible, and shall be provided on a passenger train within 160 km (100 miles) of the location where the defect occurred. After a competent person has been provided, the remaining journey time with passengers must not be expected to exceed two hours. If necessary passengers are to be de-trained at a suitable station. During poor visibility the speed is not to exceed 65 km/h (40 mph) with or without a competent person	The train can continue normally if ERTMS is working in the cab being driven from. Permitted to leave the ERTMS area but the conditions for a 'Line without ERTMS or ATP' apply	The train can continue normally if ATP is working in the cab being driven from. Permitted to leave the ATP area but the conditions for a 'Line without ERTMS or ATP' apply

Table 1: Arrangements for when AWS is defective, other than starting a journey from a maintenance depot

Rationale

G 4.5.2.2 The 50 mph limit for freight trains and 60 mph limit for all other trains is a balance between the additional risks to the train operating without the protection of AWS, with the greatest protection from TPWS when still available and the increase in network risk caused by the train travelling at reduced speed.

G 4.5.2.3 The 40 mph limit applies during poor visibility to give the driver and competent person more time to see signals, temporary speed restrictions and emergency speed restrictions.

G 4.5.2.4 Risks increase the longer the train operates without functional AWS. Therefore, arrangements to rectify the defective AWS or remove the train from service are required as soon as possible.

G 4.5.2.5 The provision of a competent person able to observe and interpret lineside signals and warning signs and check that the driver's actions are compatible with these indications is considered to reduce the risks of operating a train without functioning AWS. However, the alertness of the competent person is likely to diminish and the probability of the driver and competent person distracting each other is likely to increase over time, thus limiting the time passengers can be carried.

Guidance

G 4.5.2.6 If a train leaves an ERTMS or ATP area the distance and time restrictions applicable to a 'Line without ERTMS or ATP' commence when the train leaves the area.

G 4.5.2.7 The RU decides the competencies required of a competent person, taking into account what actions are expected of a person fulfilling this role.

G 4.5.2.8 The competent person is provided to check that the driver reacts appropriately to control the speed of the train in response to lineside signal indications and lineside warning signs.

G 4.5.2.9 A limit of two hours is imposed for passengers travelling on a train with a competent person, as the alertness of the competent person is likely to diminish over time. It is therefore undesirable for any train to operate with a competent person for more than two hours.

4.6 Brake defects

4.6.1 A railway undertaking shall implement mitigation measures if there is a brake defect that would:

a) Prevent the train stopping from the normal maximum permitted speed in the available braking distance.
b) Affect the ability of either portion to come to a stand in the event of an accidental train division.

Rationale

G 4.6.2 Signalling interlocking designs, placement of lineside signals and associated risk assessments generally make assumptions that trains will be able to stop within the

braking distances provided or within the provided safe overrun distances if train protection systems are activated.

G 4.6.3 Both portions of a divided train must be brought to a stand automatically by the train's braking system. Certain brake defects could, in the event of a train division, result in a portion of the divided train not having an operative automatic brake.

Guidance

G 4.6.4 Generic mitigation arrangements are shown in Rule Book modules TW1 and TW5. Some of these arrangements are only intended to allow a train to be moved the minimum distance to clear the line due to the speed restrictions imposed.

4.7 Doors on passenger vehicles

4.7.1 General

4.7.1.1 A railway undertaking shall base their DOTE contingency plan on the principle that passengers are not allowed to travel in a vehicle with a defective door or doors if the time required to evacuate exceeds:

a) 90 seconds for a non-LOC & PAS NTSN compliant vehicle; or
b) 180 seconds for a LOC & PAS NTSN compliant vehicle.

Rationale

G 4.7.1.2 The 90-second evacuation time was validated in trials as the time necessary to evacuate a vehicle with normal passenger loading conditions.

G 4.7.1.3 The 180-second evacuation time supports the requirements in the LOC & PAS NTSN and RIS-2730-RST and is applicable to newer design trains which present a reduced risk to passengers due to the presence of a variety of fire prevention measures.

Guidance

G 4.7.1.4 RIS-2730-RST contains guidance on how to determine the evacuation times and considerations in the development of the DOTE contingency plan. It incorporates measures for the railway undertaking to consider when compiling the risk assessment to identify the hazards that will influence the ability of passengers to evacuate a vehicle in emergency conditions.

G 4.7.1.5 A 'Door' includes a single-leaf door and bi-parting doors.

G 4.7.1.6 Evacuation may be to an adjacent vehicle, to a platform, or track level.

G 4.7.1.7 Emergency exits can support requirement *4.7.1.1* only when their access does not require the presence of staff.

G 4.7.1.8 It is good practice to include in the DOTE contingency plan arrangements to prevent passenger access to a vehicle with defective emergency exits if the vehicle remains in service.

G 4.7.1.9 If it is possible to remove passengers from the affected part of the train but not to secure internal doors or partitions, or place an alternative physical means to prevent

passengers re-entering the area, the railway undertaking determines if the train can continue in passenger service subject to additional control measures. Such arrangements may be suitable where this is the last service of the day; there will be a long interval to the next alternative service and the number of passengers is less than the remaining seating capacity and is expected to remain so. Additional control measures can include frequent announcements that passengers should not occupy the affected area, or the provision of staff to prevent access.

G 4.7.1.10 There is a wide variety of door operational arrangements on different types of vehicles. Even when the class of vehicles were identical when built, many have been modified in different ways by their owners and operators. When compiling the DOTE contingency plan, it is good practice for the railway undertaking to establish the door operating arrangements for each individual vehicle and provide specific instructions.

4.7.2 Out-of-use doors

4.7.2.1 The DOTE contingency plan shall identify vehicles on which an external door that is secured out of use can still be opened because the mechanical or electrical locking is overridden by operation of an emergency door release.

4.7.2.2 When a vehicle remains in passenger service with an external door secured out of use but available to passengers in an emergency, consideration shall be given to the best method of advising passengers that the emergency egress devices at the affected doors will still be operable.

Rationale

G 4.7.2.3 The fact that the locking out of use function can be overridden by use of the internal emergency door release is not apparent. Since vehicles that have this functionality can be allowed to continue to carry passengers when other similar vehicles cannot, it is necessary for this information to be easily available.

Guidance

G 4.7.2.4 A sign indicating that the doors are available for emergency use only may be the simplest option to inform passengers. This could be supplemented by other signs, public address announcements or by the provision of staff at the affected doors.

G 4.7.2.5 It is good practice that the DOTE contingency plan provides for the affected vehicle to travel to a maintenance depot for repair within 24 hours of the defective door being identified. Analysis of the risks of keeping a train in service (subject to the limitations in *4.7.1*) shows that they are lower than the risks to passengers from cancelled or overcrowded trains caused by withdrawal of the affected unit. The risks increase if the train remains in use with defective doors longer than 24 hours.

G 4.7.2.6 If a vehicle is to remain in passenger use with all doors defective on one or both sides, it is preferable that the emergency egress controls are of the type that remain operative if the door is out of use as this will reduce the distance any passenger has to move to reach the nearest available exit in an emergency.

4.7.3 Passengers with reduced mobility

4.7.3.1 The DOTE contingency plan shall include the situation where an external door that gives access to, or egress from, accommodation for passengers with reduced mobility is defective.

Rationale

G 4.7.3.2 If doors that give access to the accommodation for passengers with reduced mobility are placed out of use on only one side of a vehicle, passengers with reduced mobility may be unable to alight at their intended destination if the train calls at stations where the platform could be on the other side of the train.

Guidance

G 4.7.3.3 None.

4.7.4 Door unable to be closed

4.7.4.1 If an external door cannot be closed, passengers shall be detrained unless the train is not at a station or the station is not suitable for detraining. Passengers shall then be detrained at the next station.

4.7.4.2 The movement of trains with open doors shall be restricted to the minimum distance necessary to clear the line.

Rationale

G 4.7.4.3 If an external door cannot be closed, passengers might fall out of the train or attempt to board or alight in an uncontrolled manner.

G 4.7.4.4 It may be necessary to prevent passengers boarding the train if it is stopped at a signal at an intermediate station after having been taken out of passenger service.

Guidance

G 4.7.4.5 Some doors (such as plug and slam types) may cause a train to become out of gauge when open. In such cases, the permission to proceed may need to include speed restrictions when passing structures or other trains.

4.7.5 Multiple defective doors

4.7.5.1 If a train is to operate with more than one defective door, the DOTE contingency plan shall take account of the operational impact of increased station dwell times and alternative access and egress available for passengers in normal service and in emergencies (including for passengers with reduced mobility).

Rationale

G 4.7.5.2 Cumulative additional station dwell time could result in the loss of train path and considerable delay to following services.

Guidance

G 4.7.5.3 If there is more than one defective door on the train, particularly if they are not separated by vehicles without such defects, the effect on station dwell time may be multiplied.

G 4.7.5.4 On a long journey with few stops, the effect of an additional station dwell time may not be significant. Conversely, where there are frequent stops, especially on crowded trains, the cumulative effect may be a significantly extended journey time. If consideration is given to cancelling the train, the likely effects on station dwell time on the next service should also be taken into account.

G 4.7.5.5 Providing advice to staff at affected intermediate stations that a door or vehicle is out of use might be advantageous. This is to enable information to be given to waiting passengers so that delay caused by them having to move along the platform to find an operative door is reduced.

4.7.6 Failure of door controls

4.7.6.1 If there is a failure of the door operating controls at all positions on a train with power-operated doors, passengers are to be de-trained at the first suitable station. Traincrew shall either release a train crew door or use an emergency door release facility to release one door to allow passengers to alight or enter through that door.

4.7.6.2 If there is a failure of the door key switch (DKS) and the only other DKS is in the driving cab from which the train is being driven, the guard is not to enter the driving cab to release the doors until the train has come to a stand. The train may complete its journey.

4.7.6.3 If there is a failure of the central door locking operating controls at all positions on a train, passengers are to be de-trained at the first suitable station. Traincrew shall release an emergency door lock on one door to allow passengers to alight or enter through that door.

4.7.6.4 If none of the doors on a vehicle are being released correctly, the vehicle shall be placed out of use and passengers transferred to another vehicle; the train may continue its journey. If this is not possible, passengers are to be de-trained at the first suitable station.

Rationale

G 4.7.6.5 If the traincrew cannot quickly release the train doors at stations, additional station time is likely to be required which could be considerable for long trains. There is also a possibility that emergency door releases will be operated, creating another source of delay.

G 4.7.6.6 The guard may cause a distraction to the driver if they enter the cab from which the train is being driven before the train has come to a stand.

Guidance

G 4.7.6.7 The Rule Book module TW5 requires the driver to report the circumstances to the signaller immediately and await instructions.

G 4.7.6.8 The Railway Safety Regulations 1999 prohibit the operation of passenger trains with hinged doors without a means of centrally locking them in a closed position.

4.8 Driver's reminder appliance (DRA)

4.8.1 Starting a journey from a maintenance depot

4.8.1.1 A train shall not start a journey from a maintenance depot if the DRA is defective in any cab that will be driven from with the DRA required to be in use.

Rationale

G 4.8.1.2 The DRA is a device that drivers can use as a reminder not to start their train until a movement authority has been given.

G 4.8.1.3 If the DRA is defective in a cab that is to be driven from, then the driver will not have the mitigation that the DRA provides to protect against starting the train without a correct movement authority.

Guidance

G 4.8.1.4 Rule Book module TW1 details the general principles for use of the DRA, but some elements of use such as setting it whilst a train is still moving and in an ERTMS areas, is dependent on the railway undertaking's policy on its use.

4.8.2 Starting a journey from other than a maintenance depot or during a journey

4.8.2.1 If a train has been permitted to start a journey from somewhere other than a maintenance depot with a defective DRA in any cab that is required to be driven from, its final journey of the day shall be to a maintenance depot.

4.8.2.2 If the DRA becomes defective on a train during a journey, the train may continue normally but arrangements shall be made for it to make its final journey of the day to a maintenance depot.

Rationale

G 4.8.2.3 The DRA is a device that drivers can use as a reminder not to start their train until a movement authority has been given.

Guidance

G 4.8.2.4 When compiling the DOTE contingency plan, it is good practice to consider the likely number of occasions that the train will be stopped at signals and the extent to which drivers are reliant on the use of the DRA, when determining if the train may continue in use until the end of the day.

4.9 Driver's safety device (DSD) and driver's vigilance equipment

4.9.1 Starting a journey from a maintenance depot

4.9.1.1 A railway undertaking shall not allow a train to start a journey from a maintenance depot if the DSD or vigilance equipment is defective or isolated in any cab that is required to be driven from at any time during its planned workings.

Rationale

G 4.9.1.2 Having a means to monitor the driver's vigilance when the train is moving that can automatically stop the train when a lack of activity is detected is a requirement of the OPE NTSN and LOC & PAS NTSN. The intent of such systems is to mitigate the risk of driver incapacitation and the potential consequence of a train travelling too far or too fast. These hazards, when realised, can undermine the safety integrity of the railway system.

G 4.9.1.3 The risk of driver incapacitation, an event most commonly caused by medical conditions or fatigue, is estimated to be as high as a 1-in-1 year event. Therefore, the consequence and estimated frequency of a driver incapacitation event justify the DSD and driver vigilance equipment being categorised as an on-train safety system, resulting in their availability and operability needing to be checked prior to starting a journey.

Guidance

G 4.9.1.4 A train with defective or isolated DSD or vigilance equipment may start a journey from a maintenance depot provided the affected driving cab is not driven from until the defect can be rectified. For example, the affected cab may be confined within the train formation and only form an intermediate cab for the duration of its planned workings; or be allowed to form other than the leading cab for a single journey to another location where the fault can be rectified.

G 4.9.1.5 It is considered reasonable to expect vehicle maintainers to have systems in place to facilitate the identification and rectification of faults affecting on-train safety systems before an affected vehicle is required to start a journey from a maintenance depot. Furthermore, it is assumed that vehicle maintainers may be able to prevent the defective driving cab from forming the leading cab of any train until the fault is rectified.

G 4.9.1.6 RIS-2761-RST contains information on the driver's activity function systems.

4.9.2 Starting a journey from other than a maintenance depot or during a journey

4.9.2.1 A railway undertaking shall only allow a train with a defective or isolated DSD or vigilance equipment to start a journey from other than a maintenance depot or continue a journey at the normal permissible speed provided one of the following applies:

a) The affected driving cab will not be driven from at any time during the journey; or
b) A competent person is provided.

4.9.2.2 A railway undertaking shall only allow a train with a defective DSD or vigilance equipment in the driving cab from which it is to be driven to convey passengers if one of the following applies:

a) A competent person is provided; or
b) The train speed is restricted as set out in table *2*.

4.9.2.3 If the railway undertaking is unable to provide a competent person, then a train with defective or isolated DSD or vigilance equipment may start a journey from other than a maintenance depot or continue its journey to the next available location, but the train speed shall be restricted as set out in Table *2*.

Passenger train	Freight train or OTM
95 km/h (60 mph)	80 km/h (50 mph)

Table 2: Arrangements for when DSD is defective, other than starting a journey from a maintenance depot or during a journey

4.9.2.4 If the DSD or vigilance equipment defect coincides with a failure or isolation of the on-train fitted signalling system (that is, AWS, TPWS, ETCS or ATP), the railway undertaking shall include the restrictions associated with the failed or isolated on-train signalling system into their operational response before allowing the train to start a journey (see clause *G 4.9.2.10* for additional guidance).

Rationale

G 4.9.2.5 Having a means to monitor the driver's vigilance when the train is moving that can automatically stop the train when a lack of activity is detected is a requirement of the OPE NTSN and LOC & PAS NTSN. If the DSD or vigilance device is operable in the cab from which the train is to be driven from, then this requirement has been satisfied and any faults relating to any other driving cabs are irrelevant with regard to the safe operation of the train.

G 4.9.2.6 The intent of the DSD and vigilance device is to mitigate the risk of driver incapacitation and the potential consequence of a train travelling too far or too fast. However, in degraded operating conditions, when the DSD or vigilance device is defective or isolated, it is possible to achieve this intent through the effective intervention of a competent person.

G 4.9.2.7 AWS and TPWS are passive systems and will only intervene if the driver fails to acknowledge associated in-cab warnings or fails to control the speed of the train within set parameters. For these systems to provide the expected safety benefits, an assurance of driver consciousness is required. Therefore, in the absence of a competent person, any train movement with the DSD or vigilance device equipment defective or isolated is to be restricted as set out in Table *2*.

G 4.9.2.8 The speed restrictions - 80 km/h (50 mph) for freight trains and 95 km/h (60 mph) for all other trains - are a balance between the additional risks to the train operating without the protection of DSD or vigilance equipment with the greatest protection from TPWS, if available, and the increase in network risk and delays caused by the train travelling at reduced speed.

Guidance

G 4.9.2.9 A competent person is provided to monitor driver awareness and alertness when the DSD or vigilance equipment is defective or isolated in the cab from which the train is being driven. Therefore, an employee fulfilling this role needs to be familiar with the methods and equipment that can be used to bring the train to a stand and communicating such emergencies to the signaller. The most efficient means of communicating such emergencies is by using the on-train GSM-R system, therefore it is good practice for the competent person to know how to use this equipment.

G 4.9.2.10 If the DSD or vigilance equipment failure coincides with a failure of the on-train signalling interfaces in the same driving cab, then, in addition to the requirements, the railway undertaking's operational response needs to satisfy the requirements associated with the on-train signalling system. See relevant sections for details:

a) Automatic train protection (ATP). See section *4.4*.
b) Automatic warning system (AWS). See section *4.5.2*.
c) ERTMS equipment. See section *4.13.2*.
d) Train protection and warning system (TPWS). See section *4.26.2*.

4.10 Driving cab windows - broken or obscured

4.10.1 Starting a journey from a maintenance depot

4.10.1.1 A train shall not start a journey from a maintenance depot if a driver would not have a clear view of the line ahead or train dispatch equipment through any window which may need to be used.

Rationale

G 4.10.1.2 If the driver does not have a clear view of the line ahead or signals, the safe operation of the train could be compromised. If the driver is not able to observe the normal train dispatch arrangements easily, delay may be caused during the journey and the arrangements may be less satisfactory.

Guidance

G 4.10.1.3 The windscreen and other cab windows provide protection for the driver in the event of the train striking an object. Minor damage to a window might adversely affect its overall structural integrity and the protection it affords the driver.

4.10.2 Starting a journey from other than a maintenance depot

4.10.2.1 If a train is to start a journey from other than a maintenance depot with a broken, obscured or defective cab window, or if a window becomes broken, obscured or defective during a journey, consideration shall be given to reducing the speed of the train.

4.10.2.2 If the train cannot proceed safely, the signaller shall be informed and a competent person may be required to assist the driver.

4.10.2.3 If a driver reports that the driving cab windscreen is broken, obscured or defective, and the driver considers that the safe operation of the train is affected, the driver's judgement and the availability of a competent person to accompany the driver shall be taken into account in determining how long the train may continue in service.

Rationale

G 4.10.2.4 If the driver does not have a clear view of the line ahead or signals, the normal safe operation of the train could be compromised. If the driver is not able to easily observe the normal train dispatch arrangements, safety may be compromised, delay may be caused during the journey and the arrangements may be less satisfactory.

Guidance

G 4.10.2.5 It is desirable to turn a train at the earliest opportunity to allow it to be driven from a cab without the defective window. However, if further reversals and changes of cab are required to reach the maintenance depot, the overall distance to be driven from the cab with the defective window is to be considered in deciding where or if the train is to be turned. Also, additional protection from driver error is provided by ATP or ERTMS systems, so it is preferable for the sections driven from the affected cab to be those provided with these systems.

G 4.10.2.6 Depending on the amount of obscuration, the competent person will be required to observe signals and lineside warning signs and then advise the driver of these to a varying degree. The RU ensures that the competent person has adequate route knowledge.

G 4.10.2.7 The Rule Book module TW5 sets out the duties of a competent person accompanying the driver when the cab windscreen is broken or obscured.

4.11 Driving controls

4.11.1 If the driving controls become defective in the leading cab, the train shall proceed only to the first location where it can clear the running line.

4.11.2 Usually a competent person shall be provided to assist with the movement if the train is not driven from the leading cab. This may not be necessary if the train is to be controlled from a driving cab facing the direction of travel on the second vehicle and the driver considers that they have an adequate view for a very low speed movement.

Rationale

G 4.11.3 Movement of a train from other than the leading cab is likely to be difficult due to problems observing signals, receiving warning indications and observing that the line is clear.

Guidance

G 4.11.4 If the train is not being controlled from the leading driving cab, other systems such as TPWS and ERTMS may not be capable of normal use and the arrangements for when these systems are not available or defective may also apply.

4.12 Emergency bypass switch (EBS)

4.12.1 Starting a journey from a maintenance depot

4.12.1.1 A train shall not start a journey from a maintenance depot if the EBS has been operated in any cab.

Rationale

G 4.12.1.2 If the EBS is operated in the driving cab, the train brake system ceases to have the function of train continuity detection (for train divisions). Consequently, it is only possible to apply the emergency brake in the driving cab from which the train is being driven. In the event of a train division, the emergency brake will not be applied automatically on the front portion.

G 4.12.1.3 Other safety systems may also be isolated, for example, traction interlock may not be available and passenger communication alarms may be disabled on certain fleets.

Guidance

G 4.12.1.4 The EBS is a device to restore brake control following defects in the brake continuity with 'energise to release' electric brake control (predominately multiple units).

4.12.2 Starting a journey from other than a maintenance depot

4.12.2.1 A train can start a journey not carrying passengers with the EBS operated to travel to a maintenance depot for repair, provided permission is given by the railway undertaking's Control.

4.12.2.2 If the train is formed of a single multiple unit, permission can be given to start a journey not conveying passengers to travel to a maintenance depot without restriction.

4.12.2.3 If the train is formed of more than one multiple unit, permission shall be given only if one of the following applies:

a) A guard or competent person is provided to travel in the rear unit.
b) The entire movement to the maintenance depot will be on lines signalled by track circuit block (TCB) or ERTMS.

Rationale

G 4.12.2.4 After operation of the EBS the driver may not be immediately aware of a subsequent train division. The provision of a competent person in the rear unit enables any division to be detected immediately and the rear portion of the train to be secured.

G 4.12.2.5 TCB and ERTMS signalling systems require continuous train detection systems so the signalling system will protect the rear portion of a divided train.

G 4.12.2.6 Operating a passenger train without a means of passengers being able to communicate with a person who is in a position to take appropriate action in the event of an emergency is in breach of Regulation 4 of the Railway Safety (Miscellaneous Provisions) Regulations 1997.

Guidance

G 4.12.2.7 The Rule Book requires that the driver informs the signaller of the circumstances before the journey commences.

G 4.12.2.8 The signaller is to be made aware that the EBS has been operated so that if a train detection section remains occupied after the passage of the train, or a train passes without a tail lamp, the greater possibility that an undetected train division has occurred is identified as a cause.

G 4.12.2.9 On a line not fitted with lineside signals, if the train is to proceed in 'Staff Responsible (SR) mode on some routes the presence of 'stop in SR mode' balises at each marker board, make it necessary for the signaller to authorise the driver to pass each end of authority without a movement authority in line with the Rule Book module S5. If the train has to proceed in 'Isolated' mode there is no protection for the movement.

4.12.3 During a journey

4.12.3.1 If the EBS is operated during a journey, the following arrangements shall be applied:

	Action in respect of passengers	**If available, guard or competent person to be positioned in**
Train formed of one unit	None	Rear cab
Train formed of more than one unit	If possible, passengers to be transferred to the leading unit	Rear unit

Table 3: Arrangements for when EBS is operated during a journey

4.12.3.2 If the EBS is operated whilst in passenger service, passengers shall be de-trained at the first suitable station.

Rationale

G 4.12.3.3 If the EBS is operated in the driving cab, the train brake system ceases to have the function of train continuity detection (for train divisions). Consequently, it is only possible to apply the emergency brake in the driving cab from which the train is being driven. In the event of a train division, the emergency brake will not be applied automatically on the front portion.

G 4.12.3.4 After operation of the EBS, the driver may not be immediately aware of a subsequent train division. The provision of a competent person in the rear unit enables any division to be detected immediately and the rear portion of the train to be secured.

G 4.12.3.5 Operating a passenger train without a means of passengers being able to communicate with a person who is in a position to take appropriate action in the event of an emergency, is in breach of Regulation 4 of the Railway Safety (Miscellaneous Provisions) Regulations 1997.

Guidance

G 4.12.3.6 It is assumed that the EBS will not be operated during a journey until appropriate fault finding has been carried out and it is concluded that operation of the EBS is the most suitable method of allowing the train to proceed further.

G 4.12.3.7 The Rule Book requires that the driver informs the signaller of the circumstances before the movement resumes.

G 4.12.3.8 The signaller is to be made aware that the EBS has been operated so that if a train detection section remains occupied after the passage of the train, or a train passes without a tail lamp, the greater possibility that an undetected train division has occurred is identified as a cause.

G 4.12.3.9 If signal box special instructions allow 'train out of section' to be sent without a tail lamp being observed, consideration is to be given to prohibiting this method of working for a train on which the signaller has been told that the EBS has been operated.

4.13 ERTMS equipment

4.13.1 Starting a journey from a maintenance depot

4.13.1.1 A train shall not start a journey from a maintenance depot if the ERTMS equipment is not working in any cab which is required to be driven with ERTMS in operation.

Rationale

G 4.13.1.2 Railway Safety Regulations 1999 require that a train has an operative train protection system unless it commenced its journey before the discovery of the fault or it is being driven without passengers to a place for repair.

Guidance

G 4.13.1.3 None.

4.13.2 Starting a journey from somewhere other than a maintenance depot

4.13.2.1 Where the method of signalling is ERTMS, a train or traction unit shall not start a journey from other than a maintenance depot if ERTMS equipment is not working in the driving cab, unless one of the following applies:

a) On a line where lineside signals are provided, both AWS and TPWS are operating.
b) On a line where lineside signals are not provided, it is to travel (not in passenger service) to a maintenance depot for repair.

Rationale

G 4.13.2.2 Railway Safety Regulations 1999 require that a train has an operative train protection system unless it commenced its journey before the discovery of the fault or it is being driven without passengers to a place for repair.

G 4.13.2.3 On ERTMS lines provided with lineside signals, if the on-train ERTMS equipment becomes defective, the train can proceed normally provided AWS and TPWS are working because the train will operate under the same conditions as trains that are not fitted with ERTMS.

G 4.13.2.4 On ERTMS lines without lineside signals, if the on-train ERTMS equipment becomes defective, movement authority cannot be received by the train and there is little safety supervision of the driver. Consequently, the train can only proceed under severely degraded conditions.

Guidance

G 4.13.2.5 A train or traction unit on which ERTMS equipment is not operative may be allowed to start a journey from other than a maintenance depot, provided ERTMS will not be required to be used.

G 4.13.2.6 On a line without lineside signals if the on-train ERTMS equipment has failed, although movement to a maintenance depot for repair is permitted, due to severely degraded conditions, it is recommended that the train only proceeds the minimum distance necessary to clear the line.

4.13.3 During a journey - lineside signals

4.13.3.1 If ERTMS equipment becomes defective during a journey when it should be in operation on a line fitted with lineside signals, the train shall proceed as follows:

a) If both AWS and TPWS are operating, the train may proceed obeying all lineside signals.
b) If AWS or TPWS are not operating, the train can proceed in accordance with the arrangements for defective AWS or TPWS.

Rationale

G 4.13.3.2 On ERTMS lines provided with lineside signals, if the on-train ERTMS equipment becomes defective, the train can proceed normally provided AWS and TPWS are working because the train will operate under the same conditions as trains that are not fitted with ERTMS.

Guidance

G 4.13.3.3 None.

4.13.4 During a journey - no lineside signals

4.13.4.1 If ERTMS equipment becomes defective during a journey when it should be in operation on a line not fitted with lineside signals, the signaller shall authorise the driver to pass each end of authority without a movement authority, in line with Rule Book module S5 'Passing a signal at danger or an end of authority (EOA) without a movement authority (MA)'.

Rationale

G 4.13.4.2 On ERTMS lines without lineside signals, if the on-train ERTMS equipment becomes defective, movement authorities cannot be received by the train and there is little safety supervision of the driver. Consequently, the train can only proceed under severely degraded conditions and is only to travel the minimum distance necessary to clear the line.

Guidance

G 4.13.4.3 If ERTMS equipment becomes defective during a journey on a line not fitted with lineside signals, if the train has to proceed in 'Staff Responsible (SR)' mode on some routes the presence of 'stop in SR mode' balises at each marker board, make it necessary for the signaller to authorise the driver to pass each end of authority without a movement authority in line with Rule Book module S5. If the train has to proceed in 'Isolated' mode there is no protection for the movement.

G 4.13.4.4 Consideration needs to be given to extended journey times over the portion of line affected.

4.14 Exterior lamps

4.14.1 Headlights and marker lights

4.14.1.1 A train shall not start a journey from a maintenance depot if any headlight or marker light is not working on any vehicle that is required to be at the front of a train.

4.14.1.2 A train can start a journey, from other than a maintenance depot, with a failed headlight, provided a portable headlight has been provided and speed is restricted to 120 km/h (75 mph).

4.14.1.3 If the headlight fails completely during a journey, a white light shall be provided to enable the train to proceed at 30 km/h (20 mph). A portable headlight shall be provided as soon as possible.

Rationale

G 4.14.1.4 If the normal headlight is not available, the visual warning given to staff on the track and persons at unprotected level crossings is likely to be less than that assessed as necessary for safe operation.

G 4.14.1.5 If a normal headlight is not working, during darkness, drivers may not have the normal viewing time of lineside warning signs.

Guidance

G 4.14.1.6 If a vehicle has an operative marker light, it can be treated as having a white light as there is no specification for the 'white light'.

4.14.2 Tail lamps

4.14.2.1 A train shall not start a journey from a maintenance depot if any tail lamp is not working on any vehicle that is required to be at the rear of a train.

4.14.2.2 A train can start a journey, from other than a maintenance depot, with a defective tail lamp if it is fitted with two tail lamps and the other is working, or a portable tail lamp is provided.

4.14.2.3 If all the built-in tail lamps fail on a train during a journey, a portable tail lamp shall be provided. If a portable tail lamp is not immediately available, a red handlamp shall be provided. A portable tail lamp shall then be provided at the next available location.

Rationale

G 4.14.2.4 A working tail lamp is required to enable signallers controlling certain signalling systems and other staff to determine that a train is complete. A working tail lamp is also necessary to assist drivers in locating the rear of a train where permissive working is authorised and during degraded working.

Guidance

G 4.14.2.5 If a portable tail lamp has been provided, in deciding what arrangements need to be made for repair, the likely remaining battery life of the portable tail lamp and the availability of alternative portable tail lamps may need to be considered.

G 4.14.2.6 If a train with two built-in tail lamps enters service with one lamp defective, the train may complete its journeys for the remainder of the day, provided its final journey of the day ends at a maintenance depot.

4.15 Hot axle box and activation of lineside hot axle box detectors

4.15.1 Starting a journey

4.15.1.1 A railway undertaking shall not allow a train, traction unit or vehicle to start a journey with a hot axle box or a defective built-in hot axle box detector.

Rationale

G 4.15.1.2 A vehicle known to have a hot axle box is not in a safe condition for movement. Hot axle boxes and bearings have the potential to endanger the train and adjacent lines.

G 4.15.1.3 A vehicle with a defective built-in detector will not have any warning of a hot axle box.

Guidance

G 4.15.1.4 None.

4.15.2 During a journey

4.15.2.1 If a hot axle box is detected, and after examination the driver decides (in accordance with Rule Book module TW5) that the train may go forward for examination by a rolling stock technician, the train shall proceed only as far as the next available location.

Rationale

G 4.15.2.2 Hot axle boxes and bearings have the potential to cause sudden catastrophic failures, which can endanger the train and adjacent lines.

Guidance

G 4.15.2.3 Railway undertakings apply the judgement of the rolling stock technician in determining what further measures need to be applied, for example, detaching the affected vehicle.

G 4.15.2.4 If a hot axle box detection is deemed to be false upon investigation, the DOTE contingency plan may incorporate instructions to isolate the system if the type of vehicle allows it. When this is the case, it is good practice for the railway undertaking to consider the length of the remaining journey when allowing the train to continue in this condition.

4.16 In-cab external door monitors

4.16.1 A train shall not start a journey from a maintenance depot if an in-cab external door monitor cannot display an image, or the image is not sufficiently distinct, in any cab that is required to be used.

4.16.2 If an in-cab external door monitor is not displaying an image or the image is not sufficiently distinct before starting or during a journey, an alternative method of train dispatch shall be implemented for that train if the driver cannot carry out a satisfactory 'train safety check'.

Rationale

G 4.16.3 Where the normal method of train dispatch requires the driver to use in-cab external door monitors to observe that passenger doors are correctly closed and unobstructed, if one or more of the images is not present or insufficiently distinct, the train cannot be safely dispatched by that method alone. This could also affect trains that are not conveying passengers since the monitors may be required to dispatch the train from a station platform, including ones at which the train is not booked to call.

Guidance

G 4.16.4 A failure of a camera, either train or platform-mounted, will result in the appropriate image not being displayed in the cab to the driver.

G 4.16.5 If the failure is due to equipment on the train, it will be necessary to make alternative dispatch arrangements at each station at which the train is due to call. Alternative actions could be the provision of additional traincrew or platform staff to assist with dispatch or changes to the stopping pattern so that that the train only calls at stations that do not require the driver to observe that the affected door or doors are closed and unobstructed.

G 4.16.6 If the failure is due to equipment at the platform or station, it may be desirable to make arrangements for additional platform dispatch staff, re-platform trains or omit the station stop for subsequent trains. RUs will inform drivers, preferably in advance, of the revised dispatch arrangements.

G 4.16.7 RIS-3703-TOM sets out requirements on train dispatch and RIS-2703-RST provides requirements on on-train camera monitors.

4.17 Lifeguards

4.17.1 A train shall not start a journey with a loose or damaged lifeguard.

4.17.2 A train shall not start a journey with a missing lifeguard at any cab which requires to be used.

Rationale

G 4.17.3 If a lifeguard is loose or damaged it has the potential to fail further or fall off. In this condition, it may become a hazard to the train and can become trapped in the infrastructure with potential to cause a derailment.

G 4.17.4 A missing lifeguard at the leading end of a train means that protection from striking obstructions on the line is reduced.

Guidance

G 4.17.5 If the driver is unsure if it is safe for the train to proceed, examination by a rolling stock technician will be necessary. RUs apply the judgement of the rolling stock technician in determining what further measures need to be applied.

G 4.17.6 Following the discovery of a missing lifeguard, if the vehicle is formed intermediately in a train, the train may complete its journeys for the remainder of the day; it is recommended that its final journey is to a maintenance depot.

4.18 On-train data recorder (OTDR)

4.18.1 A railway undertaking shall not allow a train to start a journey from a maintenance depot without an operative OTDR that records the activity of the leading cab. However, a train with a defective OTDR may complete its journeys for the rest of the day if the defect occurs whilst starting a journey from somewhere other than a maintenance depot or during a journey.

Rationale

G 4.18.2 Having a device that records data about a train's movement, control and any warnings received or given is a requirement of the OPE NTSN. OTDRs other than the one provided for the driving cab from which the train is being driven from may not record the full range of requirements in the OPE NTSN such as AWS and TPWS indications and activations. In addition, if the train was involved in an incident, without the full range of data from the OTDR, the infrastructure manager may have to undertake significantly more testing (possibly disruptive) of the signalling system to establish what signalling indications the train had received.

Guidance

G 4.18.3 It is considered reasonable to expect vehicle maintainers to have systems in place to facilitate the identification and rectification of faults affecting on-train equipment

before an affected vehicle is required to start a journey from a maintenance depot. Furthermore, it is assumed that vehicle maintainers may be able to configure the train formation in a manner that enables activities in driving cabs from which the train is being driven to be recorded on an operable OTDR until the defective OTDR can be rectified.

G 4.18.4 A train with a defective OTDR may start a journey from a maintenance depot provided the activities in any cab from which the train is driven from can be recorded on an operational OTDR elsewhere in the train formation.

G 4.18.5 RIS-2472-RST provides guidance on the data required to be recorded.

G 4.18.6 OTDR data can assist in the investigation of incidents and alleged irregularities, as well as assisting in regular fault-finding by providing evidence on the status of train systems at the time of the incident.

G 4.18.7 It is good practice for the final journey of the day to be to a maintenance depot for the defect to be repaired.

4.19 Public address system - driver only (DO) trains

4.19.1 On a DO train, the public address (PA) system shall be operative on all vehicles carrying passengers.

Rationale

G 4.19.2 On DO (passenger) trains, the PA system provides a means of communication between the signaller and passengers in the event of the driver becoming incapacitated.

Guidance

G 4.19.3 A train can complete its journeys for the day, provided passengers can be removed from a vehicle with defective PA and it can be placed out of use. Alternatively, if a competent person travels on the train and has access to the affected vehicle(s), passengers can be allowed to travel in the vehicle(s). In either case, it is recommended that the final journey of the day is to a maintenance depot.

4.20 Sanding equipment to assist train braking

4.20.1 Starting a journey from a maintenance depot

4.20.1.1 A railway undertaking shall not allow a train to start a journey from a maintenance depot if:

a) any sanding equipment that will be the leading installed set of sanding equipment during the planned workings is defective;
b) there is no sand in one or more of the operative sandboxes; or
c) in trains with multiple sanders available, the number of available sanders is less than the minimum necessary to stop the train without difficulty.

4.20.1.2 In trains with multiple sanders, the railway undertaking shall determine if the unit has enough sanding capability to start a journey from a maintenance depot.

Rationale

G 4.20.1.3 Applying sand from the leading installed set of sanding equipment has the greatest effect on improving wheel and rail adhesion in low adhesion situations, as it maximises the number of wheelsets that operate over a sanded rail.

G 4.20.1.4 An empty sandbox or unavailable sander reduces the number of wheelsets that operate over a sanded rail and may adversely impact the braking capability of the train in low adhesion situations.

G 4.20.1.5 A train with enough sanding capability can mitigate the risk of a train travelling too far or too fast due to low adhesion.

Guidance

G 4.20.1.6 GMRT2461 provides information on how sanding can provide an effective control measure to improve stopping distances in low adhesion conditions.

G 4.20.1.7 RIS-8040-TOM sets out the requirements to identify and plan the mitigation of conditions of low adhesion between the wheel and the rail.

G 4.20.1.8 The leading installed set of sanding equipment is generally on the leading vehicle, but other configurations may also be in use.

G 4.20.1.9 The sanding equipment assists with train braking in low adhesion conditions. The addition of sand to the railhead can raise the level of adhesion. Low levels of rail adhesion can be encountered unexpectedly at any location and at any time, especially during or following a light shower of rain.

G 4.20.1.10 It is good practice for the railway undertaking to include the following factors in their assessment to establish the minimum requirements to operate:

a) Driver training policy applicable to poor railhead conditions;
b) Predicted weather conditions along the route where the train will be operated;
c) Known areas of low adhesion along the route;
d) Known time periods of poor adhesion – for example, leaf fall season;
e) Impact of unavailable or reduced sanding capability on braking performance in low adhesion conditions; and
f) Train formation and location of defective sanders.

4.20.2 Starting a journey from other than a maintenance depot or continue a journey

4.20.2.1 The railway undertaking shall determine that a train formation will have enough sanding capability to brake in low adhesion conditions before permitting a train to start a journey from other than a maintenance depot; or continue a journey if:

a) any sanding equipment that will be the leading installed set of sanding equipment is defective; or
b) the sandboxes are empty.

Rationale

G 4.20.2.2 See clause *G 4.20.1.3*.

G 4.20.2.3 See clause *G 4.20.1.4*.

G 4.20.2.4 See clause *G 4.20.1.5*.

Guidance

G 4.20.2.5 See clause *G 4.20.1.6*.

G 4.20.2.6 See clause *G 4.20.1.7*.

G 4.20.2.7 See clause *G 4.20.1.8*.

G 4.20.2.8 See clause *G 4.20.1.9*.

G 4.20.2.9 See clause *G 4.20.1.10*.

G 4.20.2.10 It may be appropriate for a train with defective sanding equipment to proceed at a reduced speed or de-train passengers at the first suitable station.

G 4.20.2.11 It is good practice for the final journey of the day to be to a location where the sand can be replenished, or the sanding equipment repaired, if it has not been possible to do so earlier.

4.21 Selective door opening (SDO)

4.21.1 If the SDO equipment on a train becomes defective and measures cannot be put in place to control the hazard, passengers shall be de-trained at the first suitable station.

4.21.2 If information is received that due to a failure of lineside equipment the SDO is not operating correctly at a station or platform, specific arrangements shall be put in place to control the hazard at that location.

Rationale

G 4.21.3 To avoid risk of injury to passengers alighting where there is not a platform, it is desirable that only doors accommodated in a platform are released, other than in an emergency.

Guidance

G 4.21.4 A train on which the SDO is found to be defective may complete its journeys for the day, provided measures are put in place to control the hazard to passengers of doors opening where there is no platform. Measures may include:

a) Using the train on another route without short platforms.
b) Reducing the length of the train.
c) Transferring passengers from and placing out of passenger use the affected vehicle(s).
d) Changing the stopping pattern to avoid the short platforms.
e) Providing a competent person in the affected vehicle to prevent egress where there is no platform.

f) Use of degraded or default SDO modes.
g) Use of the public address system.

G 4.21.5 Considerations include:

a) The number of short platforms at which the train is to call.
b) The anticipated number of passengers for each of the stations with short platforms.
c) The number of passengers on the train.
d) The availability of competent staff on trains and at stations.
e) The likelihood of awareness amongst passengers of the hazard.

G 4.21.6 If the failure of the equipment is restricted to a specific station or platform, arrangements to control the hazard may include arranging for trains not to call at that station or platform.

G 4.21.7 It is recommended that the final journey of the day is to be to a maintenance depot.

4.22 Speedometer

4.22.1 General

4.22.1.1 A train shall not start a journey unless there is a working speedometer displaying the correct units of speed in any cab which is required to be driven from.

4.22.1.2 If a speedometer fails during a journey, the train shall only proceed to the next available location.

Rationale

G 4.22.1.3 A working speedometer in the driving cab is necessary to advise the driver of the train speed. This enables the driver to avoid exceeding the permitted speed and to avoid the intervention of safety systems such as ATP, ERTMS and TPWS.

Guidance

G 4.22.1.4 It is desirable to turn a train at the earliest possible opportunity to allow it to be driven from a cab with a working speedometer. However, further reversals and changes of cab may be required to reach a maintenance depot. The objective is to reduce to a minimum the distance the train is to be driven from the cab with the defective speedometer.

4.22.2 Alternative speedometer

4.22.2.1 If an alternative speedometer is provided in the cab it shall be assessed for suitability for use by the driver. This information shall then be included in the working instructions for each class of rolling stock or shown in the contingency plan.

Rationale

G 4.22.2.2 An alternative speedometer may not be suitable for use by drivers due to its location or readability.

Guidance

G 4.22.2.3 An alternative speedometer might be provided by the train management system (TMS) or other systems. If the size of the display and location in the cab allows it to be viewed and read from the normal driving position, it can be considered as an operative speedometer.

4.23 Tilt authorisation and speed supervision system (TASS) (tilting trains only)

4.23.1 If the speed supervision system becomes defective during a journey, the train shall only proceed at permissible speed, not enhanced permissible speed (EPS).

4.23.2 If the train tilt system has failed in other than the centre position, the train shall only proceed to the next available location where the train can be repaired or taken out of service.

Rationale

G 4.23.3 A Tilt Authorisation and Speed Supervision System (TASS) is necessary for operation at EPS.

G 4.23.4 If the tilt system has failed on a vehicle in other than the centre position, clearances may be reduced and platform stepping distances affected.

Guidance

G 4.23.5 If the train tilt authorisation system has failed in the tilt centred position ('right side' failure), controls might include allowing the train to run at permissible speed (not EPS), or confining the train to routes where there is no TASS lineside equipment.

G 4.23.6 If the speed supervision system becomes defective during a journey, the train may complete its journeys for the remainder of the day. It is good practice for its final journey to be to a maintenance depot.

G 4.23.7 If the tilt authorisation system becomes defective during a journey, the train may complete its journeys for the remainder of the day; it is good practice for its final journey to be to a maintenance depot.

4.24 Track circuit actuators (TCA)

4.24.1 A train shall not start a journey from a maintenance depot if the TCA:

a) Is isolated on any vehicle.
b) Isolating switch is unsealed.
c) Warning light indicates a system fault.

4.24.2 A train can start a journey from other than a maintenance depot with one or more TCAs defective or isolated provided:

a) There is at least one TCA working on the train, if the train is composed of one or more vehicles.
b) There is a TCA working on either of the first two vehicles and a TCA working on either of the last two vehicles, if the train is composed of three or more vehicles.

4.24.3 Alternatively, authority can be given for the train to start a journey if there is at least one working TCA on the train and the TCA advisor tool allows this for the specific route the train is to travel over.

4.24.4 If a TCA becomes defective during a journey, Rule Book module TW5, 'Preparation and movement of trains: Defective or isolated vehicles and on-train equipment', sets out the requirements for how a train can continue. Authority can be given for the train to continue normally if there is at least one working TCA on the train and the TCA risk advisor tool allows this for the specific route the train is to travel over.

4.24.5 If authority for the train to continue normally cannot be given, the train is to proceed only to the next available location where it can be:

a) Remarshalled
b) Repaired; or
c) Taken out of service.

Rationale

G 4.24.6 TCAs improve the ability of track circuit based signalling systems to detect the presence of a vehicle and to protect it. If sufficient numbers of TCAs are not working, there is an increased risk that the signalling system will not adequately protect the train. There is also a possibility that automatic level crossings may not be able to give users sufficient warning of the approaching train.

Guidance

G 4.24.7 RIS-2777-RST gives guidance on using the TCA risk advisor tool in developing the content of the DOTE contingency plan.

4.25 Traction interlock switch (TIS)

4.25.1 A train shall not start a journey from a maintenance depot if the TIS has been operated or is unsealed in any cab.

4.25.2 A train shall not start a journey conveying passengers from somewhere other than a maintenance depot if the TIS has been operated or is unsealed in any cab.

4.25.3 If the TIS has been operated on a train during a journey, the passengers shall be de-trained at the first suitable station. The train shall proceed to the next available location where it can be repaired or taken out of service.

Rationale

G 4.25.4 The traction interlock ensures that traction power cannot be applied if an external passenger door is not properly closed. If the TIS has been operated, traction power can be applied if a door is not properly closed or becomes open whilst the train is in motion.

Guidance

G 4.25.5 None.

4.26 Train protection and warning system (TPWS)

4.26.1 Starting a journey from a maintenance depot

4.26.1.1 A train shall not start a journey from a maintenance depot if the TPWS is not working in any cab from which it is required to be driven when TPWS is required to be in operation.

Rationale

G 4.26.1.2 It is a requirement of the Railway Safety Regulations 1999 that a train has an operative train protection system unless it commenced its journey before the discovery of the fault or it is being driven without passengers to a place for repair.

G 4.26.1.3 TPWS provides an important safety function in ensuring that speed is reduced approaching stop signals equipped with TPWS, buffer stops and some speed restrictions. It will also bring a train to a stand if a signal equipped with TPWS is passed at danger. If the TPWS system is not available on a train, arrangements to rectify this or replace the train are required as soon as possible.

Guidance

G 4.26.1.4 None.

4.26.2 Starting a journey from other than a maintenance depot or during a journey

4.26.2.1 On trains where the TPWS is defective, in situations other than starting a journey from a maintenance depot, arrangements shall be made as shown in the table below:

	Line without ERTMS or ATP	Line where ERTMS is in operation	Line where ATP is provided
Train to start a journey carrying passengers	Not permitted	Permitted if ERTMS is working in the cab being driven from. Not to enter a line where TPWS is required to be in operation driven from the cab in which the TPWS is defective	Permitted if ATP is working in the cab being driven from. Not to enter a line where ATP is not provided driven from the cab in which the TPWS is defective
Train to start a journey not carrying passengers	Permitted to travel to a maintenance depot. Conditions for 'During a journey' apply (see below)	Permitted if ERTMS is working in the cab to be driven from	Permitted if ATP is working in the cab being driven from

	Line without ERTMS or ATP	Line where ERTMS is in operation	Line where ATP is provided
During a journey	Freight trains and OTMs are not to exceed 80 km/h (50 mph) all other trains are not to exceed 95 km/h (60 mph) unless a competent person is provided. Additional signalling controls to protect conflicting movements are required. A competent person shall be provided as soon as possible, and must be provided on a passenger train within 160 km (100 miles) of the location where the defect occurred. After a competent person has been provided, the remaining journey time with passengers must not be expected to exceed two hours. If necessary, passengers are to be de-trained at a suitable station	The train can continue normally if ERTMS is working in the cab being driven from	The train can continue normally if ATP is working in the cab being driven from

Table 4: Arrangements for when TPWS is defective, other than starting a journey from a maintenance depot

4.26.2.2 If TPWS fails to activate when it should have, it shall be treated as defective.

Rationale

G 4.26.2.3 It is a requirement of the Railway Safety Regulations 1999 that a train has an operative train protection system unless it commenced its journey before the discovery of the fault or it is being driven without passengers to a place for repair. After discovery of a fault, the regulations require suitable measures to be taken to mitigate the risk of trains colliding or derailing.

G 4.26.2.4 TPWS provides an important safety function in ensuring that speed is reduced approaching stop signals equipped with TPWS, buffer stops and some speed restrictions. It will also bring a train to a stand if a signal equipped with TPWS is passed at danger. If the TPWS system is not available on a train, arrangements to rectify this or replace the train are required as soon as possible.

G 4.26.2.5 The 80 km/h (50 mph) limit for freight trains and 95 km/h (60 mph) for all other trains is a balance between the additional risks caused by the train operating without the protection of TPWS and the increase in network risk caused by the train travelling at reduced speed.

G 4.26.2.6 The risks increase the longer the train operates without TPWS being available. Therefore, arrangements to rectify this or replace the train are required as soon as possible.

G 4.26.2.7 The provision of a competent person able to observe and interpret lineside signals and warning signs and check that the driver's actions are compatible with these indications is considered to reduce the risks from operating a train without operative TPWS. However, the alertness of the competent person is likely to diminish over time and the ability of the driver and competent person to distract each other is likely to increase over time.

Guidance

G 4.26.2.8 The competent person is provided to check that the driver reacts appropriately to control the speed of the train in response to lineside signal indications and lineside warning signs in such a way that a TPWS intervention would not be received in normal circumstances.

G 4.26.2.9 A limit of two hours is imposed for passengers travelling on a train with a competent person, as the alertness of the competent person is likely to diminish over time. It is therefore undesirable for any train to operate with a competent person for more than two hours.

G 4.26.2.10 Additional signalling controls as referred to in the 'during a journey' section of the table above are set out in Rule Book module TW5.

4.27 Train radio equipment

4.27.1 General

4.27.1.1 A train shall not start a journey from a maintenance depot if the radio is not working in any cab from which it is required to be driven.

4.27.1.2 When starting a journey from other than a maintenance depot, if the radio is not working in any cab from which it is required to be driven, then the requirements within RIS-3780-TOM, 'Operational Requirements for GSM-R Radio' shall apply.

Rationale

G 4.27.1.3 The Operation and Traffic Management National Technical Specification Notice (OPE NTSN), Appendix B, section 8.1, 'Failure of train radio detected during train preparation' states: 'In case of on-board train radio failure a train shall not be permitted to start a service on lines where a radio is required'.

Guidance

G 4.27.1.4 Further information on the definition of a failure of a GSM-R radio and arrangements to be made for dealing with them can be found in RIS-3780-TOM.

4.27.2 RETB radio

4.27.2.1 On lines signalled by Radio Electronic Token Block (RETB), a train shall not start a journey from any location without operative RETB cab radio equipment.

4.27.2.2 If a train RETB radio becomes inoperative during a journey, the measures to be taken by the driver shall be according to the instructions for the operation of the system. Contingency arrangements involving passengers shall take account of the infrequent service, remoteness of stations and the availability of road access.

Rationale

G 4.27.2.3 The normal method of communication between drivers and signallers is by the train radio and the visual indication of a movement authority is given by the RETB radio.

Guidance

G 4.27.2.4 None.

4.28 Tripcocks

4.28.1 A train or traction unit shall not start a journey from a maintenance depot if a tripcock is defective.

4.28.2 A train can start a journey from somewhere other than a maintenance depot with a defective tripcock, provided it will not operate on a line fitted with tripcock apparatus.

4.28.3 A train with a defective tripcock can start a journey not conveying passengers on a line fitted with tripcock apparatus to travel to a maintenance depot.

4.28.4 A train with a defective tripcock which is not at the driving cab end can start a journey conveying passengers on a line fitted with tripcock apparatus to travel to a maintenance depot.

4.28.5 On lines equipped with tripcock and other safety systems, such as TPWS, a train with a defective tripcock can operate if the other safety systems are operational on the

train subject to any restrictions published in the Sectional Appendix or other publication applicable to the route.

4.28.6 If a tripcock becomes defective on a train during a journey on a line fitted with tripcock apparatus, passengers shall be de-trained at the first suitable station.

Rationale

G 4.28.7 Tripcocks stop trains if they exceed their movement authority or approach buffers stops too quickly. If the tripcock is defective, arrangements to rectify this or replace the train are required as soon as possible.

G 4.28.8 Lines equipped with tripcock apparatus are not necessarily provided with other safety systems such as TPWS.

Guidance

G 4.28.9 The instructions to train drivers and other staff involved for dealing with defective tripcocks are published in the Sectional Appendices or other publications applicable to the routes on which tripcock apparatus is used.

4.29 Vehicles with locked wheels / wheel flats / shifted tyres / dragging brakes

4.29.1 Starting a journey

4.29.1.1 A railway undertaking shall not allow a train or vehicle with suspected locked wheels, shifted tyres, dragging brakes or obvious damage to the wheels to start a journey.

Rationale

G 4.29.1.2 Wheel defects have the potential to damage trains and the infrastructure. Attempting to operate trains with locked wheels can cause overheating and fire at the brakes or axle bearings. Dragging a locked wheel will cause abrasion damage to the railhead and flats on the wheel that, in turn, can cause damaging impact loads between the wheel and rail.

Guidance

G 4.29.1.3 Obvious damage to the wheels is defined in clause *4.29.2.4*.

G 4.29.1.4 RIS-2766-RST provides wheelsets dimensional limits and operational restrictions for maintainers and train preparers.

4.29.2 During a journey

4.29.2.1 A railway undertaking shall not allow a train with suspected locked wheels, shifted tyres, dragging brakes or obvious damage to the wheels to continue a journey, unless it is confirmed the movement of the wheels is not restricted and there is no damage.

4.29.2.2 If a train is stopped by any of the conditions in *4.29.2.1*, the railway undertaking shall use the driver's judgement to decide if:

a) The train can continue normally; or

b) The wheels need to be examined.

4.29.2.3 If a train is stopped due to suspicion of dragging brakes, the railway undertaking shall use the driver's judgement to assess if the wheel's movement is restricted or impeded. After the driver examination:

a) If the brakes are released and there is no evidence of damage, the train may continue normally;
b) If not released, the brakes shall be isolated, and the train may continue subject to the conditions for brake defects; or
c) If after isolating the brakes, movement is still impeded, the train may only move forward as far as necessary to clear the line subject to a maximum speed of 10 mph (15 km/h) or 5 mph (10 km/h) over points and crossings.

4.29.2.4 If the wheels need to be examined during operations, the railway undertaking shall use the driver's judgement to assess the extent of the damage to the wheels. After the driver examination:

a) If no evidence of damage, the train shall proceed normally to the next available location;
b) If obvious damage is found (a wheel flat is 60 mm or more in length), the train shall only be moved at no more than 30 km/h (20 mph). The train may be moved at a higher speed if the damage has been examined by a rolling stock technician; or
c) If serious damage is found (a wheel flat is 100 mm or more in length, a flange on the outside of the wheel or suspicion of shifted tyres) or the wheels are locked, the train shall only be moved the minimum distance necessary to clear the line after it has been examined by a rolling stock technician.

4.29.2.5 If a vehicle generates a wheel impact load detection (WILD) alarm and the detected forces are sufficiently great, the railway undertaking shall:

a) Only allow a train to continue its journey subject to the maximum speed imposed by the infrastructure manager; and
b) Not allow a vehicle that has been detached or completed its journey to start another journey until it has been examined by a rolling stock technician.

Rationale

G 4.29.2.6 Wheel defects affect the safe movement of the vehicle and have the potential to damage trains and the infrastructure causing cracking of the rails. They can also increase rail temperatures and be a cause of lineside fires. The imposed control measures and associated speeds are the necessary controls to reduce the impact forces caused and potential damage caused by wheel flats after they are initially found in order to get the vehicle to a suitable point where the wheels can be further inspected and maintained. Speed restrictions are necessary to maintain functional contact with the track, switches and crossings. At lower speeds, the forces exerted on the infrastructure by a wheel flat are reduced.

G 4.29.2.7 WILD equipment is used by the infrastructure manager to detect vehicles with wheel flats and prevent infrastructure damage. Alert levels are set for impact loads and the associated speeds at which the train is to be restricted.

G 4.29.2.8 The limitations on the duration a train with a wheel defect is permitted to travel are imposed by the nature of the fault.

Guidance

G 4.29.2.9 Rule Book module TW5 contains relevant instructions on how to deal with vehicles suspected to have locked wheels, shifted tyres, dragging brakes or obvious damage to the wheels, which includes provision for the driver to undertake a visual examination of the wheelset.

G 4.29.2.10 Conditions for brake defects and isolations can be found in section *4.6* and Rule Book modules TW1 and TW5.

G 4.29.2.11 It is good practice for the railway undertaking to make provision for all events initially examined by the driver to be examined by a rolling stock technician to confirm the presence or extent of any damage to the wheels.

G 4.29.2.12 A comprehensive DOTE contingency plan also incorporates the wheelsets requirements of RIS-2766-RST. The standard provides the dimensional limits and operational restrictions for wheel flats following a rolling stock technician examination and the actions for the railway undertaking to take when defects are identified. The restrictions contained in Rule Book module TW5 are more severe than those in RIS-2766-RST because they are based on the examination being carried out by the driver.

G 4.29.2.13 The speed restriction imposed following a WILD alert will depend on the force detected and the type of vehicle concerned. In exceptional circumstances, the train will be stopped immediately and only proceed after arrangements have been agreed between the infrastructure manager and the railway undertaking.

4.30 Warning horn

4.30.1 A train shall not start a journey from a maintenance depot if the warning horn is defective in any cab that is required to be used.

4.30.2 If a train starts a journey from somewhere other than a maintenance depot with the warning horn partially defective, for example one tone not working, or there is a partial failure of the horn during a journey, the train may complete its journeys for the remainder of the day. It is recommended that the final journey of the day is to a maintenance depot.

4.30.3 If a warning horn becomes completely defective on a train during a journey, the train shall be turned, remarshalled, repaired or taken out of service at the next available location.

Rationale

G 4.30.4 The warning horn is used to warn users of some types of level crossings that a train is approaching. It is also a means of warning anyone who is on the track that a train is approaching. Although receipt of a warning by train horn should not form part of a safe system of work for persons working on the infrastructure, drivers are required to sound the horn as a warning to anyone on the track.

Guidance

G 4.30.5 None.

4.31 Wheel slide protection (WSP) equipment

4.31.1 A train shall not start a journey from a maintenance depot if the WSP equipment is defective.

4.31.2 If the WSP equipment is defective, a train is permitted to start a journey not conveying passengers to travel to a maintenance depot, except if the driver believes that there may be difficulty in stopping the train.

4.31.3 If the WSP equipment becomes defective on a train during a journey and it is decided that the train should not continue in service, the passengers shall be de-trained at the first suitable station. The train shall proceed only as far as the next available location where it can be repaired or taken out of service.

Rationale

G 4.31.4 If the WSP equipment is defective on a train, it can result in extended stopping distances such that a train cannot stop safely within its movement authority or correctly at its calling points. Defective WSP equipment can also result in significant damage to the train's wheelsets and infrastructure.

G 4.31.5 The activation of the WSP system is used on many train types to initiate sander operation to improve adhesion. If the WSP system does not activate correctly, it is likely that the sanders will also not activate.

Guidance

G 4.31.6 These requirements apply to equipment intended to control wheel slide during braking. They are not intended to apply to equipment provided to control wheel slip during acceleration.

G 4.31.7 The following are some of the factors that may be considered in determining whether the train can start or complete its journey:

a) The local track conditions and whether these affect the ability of the train to stop.
b) Predicted weather conditions along the route.
c) Remaining journey length.
d) Potential or confirmed low adhesion along the route.
e) Type and extent of suspected or confirmed WSP faults.
f) Location of maintenance depots.
g) Information available on detection and monitoring of WSP system functionality (if detection system present).
h) Type of train, including the available WSP detection and method of sander initiation.

G 4.31.8 The requirements applicable to sanders also form as part of the decision-making process.

G 4.31.9 If the WSP system is identifying wheel slide when it is not present, the sanders may be activated when not necessary resulting in supplies of sand becoming depleted and potentially not being available when required.

Part 5 Equipment that can be included in the DOTE Contingency Plan

5.1 Bodyside windows

Guidance

G 5.1.1 Bodyside windows provide protection to passengers from the elements, objects which may contact the side of the train, and prevent passengers from leaning too far out. In the event of a derailment, they may form part of the train's passenger containment system.

G 5.1.2 A window with a crack longer than 80 mm is normally considered to be broken.

G 5.1.3 It is good practice for a vehicle not to start a journey from a maintenance depot with a broken bodyside window.

G 5.1.4 For many years a vehicle with a broken outer bodyside window was not allowed to exceed 100 mph (160 km/h). This was relaxed if a railway undertaking was able to show that the aerodynamic shock from passing trains would not pose a risk of damage to either train due to the failure of the damaged window.

G 5.1.5 If a vehicle starts a journey from somewhere other than a maintenance depot with a broken bodyside window, or if a bodyside window is broken during a journey, it is considered that it would be in order for it to complete its journeys for the remainder of the day.

G 5.1.6 Alternatively, a vehicle may continue in use until the time originally scheduled to arrive at a maintenance depot if the railway undertaking has effective measures in place to control risks to passengers and others for a longer period than the day of the breakage and these can be monitored.

G 5.1.7 If a vehicle is to continue in use until the time originally scheduled to arrive at a maintenance depot, effective measures may include:

a) An emergency window.
b) Boarding up of the broken window.
c) Placing the vehicle or portion of the vehicle out of passenger use.

G 5.1.8 When considering if a measure is robust in this context, the effect of normal operating conditions including speed, tunnels and passing trains are taken into consideration.

5.2 Buffers

Guidance

G 5.2.1 A defective buffer may affect the safe movement of the train and lead to derailment, particularly on curves.

G 5.2.2 Crashworthy buffers with energy absorbing elements are required on some tank wagons used to convey dangerous goods. The energy absorbing properties may not be effective if a buffer is defective.

G 5.2.3 It is good practice that if a vehicle has developed a defective buffer, the train proceeds only as far as the next available location where it can be repaired or taken out of service. For a passenger train, de-training passengers at the first suitable station may also need to be considered.

G 5.2.4 The potential effects of the curvature of the line over which the train is to travel and possible speed reductions to reduce the possibility of derailment may need to be considered.

5.3 Cab heating and air conditioning

Guidance

G 5.3.1 GMRT2176 requires that carbon dioxide levels remain at an acceptable level and that for driving cabs a minimum of 60 cubic metres of air per hour per person is required.

G 5.3.2 If the cab temperature or humidity is likely to remain outside the range of those considered as comfortable for more than a short period, this may affect the driver's performance.

G 5.3.3 If a driver reports that the cab heating or cooling equipment is defective and considers that the safe operation of the train will be affected, it is good practice for their judgement to be taken into account in determining how long the train may continue safely in service.

G 5.3.4 Where the cab fresh air is normally supplied by air conditioning equipment, the DOTE contingency plan for specific traction types may need to set out what alternative ventilation arrangements are possible.

G 5.3.5 Remarshalling multiple units so that the affected cab will not be driven from, is a possible short-term alternative measure.

5.4 Fire detection and fire suppression systems

Guidance

G 5.4.1 Fire detection and suppression systems are provided on vehicles that convey passengers and have a significant potential source of fire risk, such as an engine. The purpose of these systems is both to alert the traincrew in the event of a fire occurring and to suppress it automatically by discharging extinguishant.

G 5.4.2 It is good practice for a train not to start a journey from a maintenance depot with a defective fire detection system or defective fire suppression system.

G 5.4.3 It is good practice for passengers to be de-trained at the first suitable station if a fire detection system becomes defective on a train during a journey.

G 5.4.4 There is no reason why a train not conveying passengers cannot start a journey from somewhere other than a maintenance depot, with a defective fire detection system, to travel to a maintenance depot. However, if the fire hazard can be reduced, for example by isolating the engine covered by the defective fire detector, the train could convey passengers.

G 5.4.5 If the fire hazard can be reduced, the train can continue its journeys for the rest of the day. It is good practice for its final journey to be to a maintenance depot.

G 5.4.6 On some types of trains, if a fire is detected, the train ventilation system is then configured to reduce the air pressure in the area of the fire and increase the pressure in adjacent vehicles. This is intended to reduce the likelihood of smoke entering adjacent vehicles until the train can be stopped at a suitable location. If the whole or part of the fire detection system is defective, it may be necessary to consider how the defect might affect the spread of smoke in the train and the effect this might have on the ability of the train to be able to proceed to a suitable location for evacuation.

G 5.4.7 Systems to detect passengers smoking are considered not to be subject to this guidance.

G 5.4.8 If a fire suppression system is fitted and becomes defective when starting a journey from other than a maintenance depot or during a journey, as long as there is a fully operational fire detection system and the fire hazard can be reduced, the train may continue its journeys for the rest of the day. The railway undertaking's risk assessment informs the DOTE contingency plan by considering the system risk and identifies if the train can continue in service subject to additional control measures. It is good practice for its final journey to be to a maintenance depot.

Note: This guidance is aimed at diesel-fuelled vehicles and electric vehicles with external power sources (conductor rail or overhead line equipment - OLE). This guidance will be revised as alternative sources of fuel are integrated into rail vehicles, for example, hydrogen or batteries.

5.5 On-train emergency equipment

Guidance

G 5.5.1 A railway undertaking may decide that emergency equipment additional to that required by the Rule Book module TW1, 'Preparation and movement of trains', is necessary.

G 5.5.2 If a railway undertaking has identified that emergency equipment additional to that required by the Rule Book module TW1, is necessary it would be difficult to justify a train starting a journey with any of this equipment missing or incomplete.

G 5.5.3 However, if this additional equipment is only required if the train is conveying passengers, such as a ladder used to detrain passengers other than in a platform, the train could start a journey not conveying passengers.

5.6 Passenger communication apparatus (PCA)

Guidance - General

G 5.6.1 Operating a passenger train without a means of passengers being able to communicate with a person who is in a position to take appropriate action in the event of an emergency is in breach of Regulation 4 of the Railway Safety (Miscellaneous Provisions) Regulations 1997.

G 5.6.2 The PCA provides a means of enabling passengers to alert the driver to:

a) A train defect.
b) A hazard to their safety or welfare on the train, such as a violent disturbance.
c) Illness.
d) A passenger endangered during train dispatch.

G 5.6.3 On many trains, the PCA also provides two-way communication between the driver and the location in the train where the PCA has been activated.

G 5.6.4 Consequently, it is good practice for a vehicle not to start a journey from a maintenance depot with a defective PCA.

Guidance - Driver only (DO) passenger trains

G 5.6.5 It is good practice that a DO passenger train does not start a journey from any location with a defective or isolated PCA.

G 5.6.6 If a defect occurs during a journey, it is good practice for passengers to be detrained at the first suitable station.

Guidance - Non-DO passenger trains

G 5.6.7 It is possible for a non-DO passenger train to start a journey from other than a maintenance depot with a defective PCA if suitable control measures are in place and that these remain in place until the train has returned to a maintenance depot.

G 5.6.8 If a PCA becomes defective during a journey, suitable control measures may be implemented. If it is not practical to apply suitable control measures, it is good practice for passengers to be de-trained at the next suitable station. The train may then proceed to a maintenance depot.

G 5.6.9 Suitable measures may include placing the vehicle out of passenger use or allowing passengers to travel in the affected vehicle if all the following conditions apply:

a) The train does not exceed three passenger vehicles.
b) Passenger numbers are less than each vehicle's seating capacity and are expected to remain so.
c) A competent person is provided and has access to all passenger accommodation.
d) This person has a means of applying the brake in an emergency or communicating with the driver.
e) The final journey of the day is to a maintenance depot.

5.7 Public address (PA) systems - Non-DO trains

Guidance

G 5.7.1 PA systems are used to inform passengers about any delays or emergency situations. They are also used to inform passengers about the destination, stopping pattern of the train and stations with short platforms.

G 5.7.2 It is good practice that a vehicle does not start a journey from a maintenance depot with a defective PA system.

G 5.7.3 If a train starts a journey from other than a maintenance depot with a defective PA system in any vehicle, or the PA system becomes defective during a journey, contingency arrangements may be considered.

G 5.7.4 Examples of contingency arrangements include:

a) Placing a vehicle out of passenger use.
b) Arranging for staff to provide information to passengers in the defective vehicle.

G 5.7.5 The railway undertaking may, depending on the circumstances of each defect, allow the train to continue its journeys with contingency arrangements in place either:

a) For the rest of the day, or
b) Until the next scheduled visit to a maintenance depot.

G 5.7.6 The DOTE contingency plans for defective PA may take account of the type of operation, the type of rolling stock, the requirements for information to be given to passengers and the number of on-train staff who could provide information as an alternative to the PA. The plan may consider the frequency of scheduled visits to a maintenance depot and the likelihood of a train failure or other incident occurring when the PA could assume a safety-related function.

5.8 Train lighting (internal)

Guidance

G 5.8.1 Vehicles with no operative or partially defective lighting can present a hazard to the safety of passengers and give a poor public image and are therefore to be avoided. Prolonged or predictable operation may attract thieves and pickpockets etc.

G 5.8.2 If a vehicle is to start or continue a journey with defective lighting, the railway undertaking may wish to consider applying contingency arrangements on an individual basis. This is to take account of the extent of the failure (whole train or single vehicle), whether journeys can be completed during daylight, the presence and length of tunnels on the route(s) to be traversed and whether the train will pass over any automatic open crossing locally monitored (AOCL) or automatic barrier crossing locally monitored (ABCL) during darkness.

G 5.8.3 The vehicle may remain in service if its final journey of the day is to a maintenance depot and:

a) Measures are put in place to reduce or eliminate the hazards, such as placing the vehicle out of passenger use and transferring passengers to another vehicle.
b) The route(s) to be traversed has no long tunnels and passenger journeys can be completed during daylight.
c) The route(s) to be traversed during darkness does not have AOCL or ABCL level crossings, as during certain failures of these crossings a train may not be able to proceed over such a crossing unless its internal lights are illuminated. See Rule Book module TW8, 'Level crossings - drivers' instructions', for the applicable rules.

G 5.8.4 If no suitable contingency measures are available, it is good practice for passengers to be de-trained at a suitable station depending on local conditions.

5.9 Vehicle couplings

Guidance

G 5.9.1 With a defective coupling, a vehicle is limited in its operable abilities. In the event of a train failure, the lack of a fully functioning coupling is likely to cause difficulties in arranging assistance.

G 5.9.2 It is good practice for a train not to start a journey from a maintenance depot if a vehicle coupling is defective or damaged on any vehicle.

G 5.9.3 If a train starts a journey from somewhere other than a maintenance depot with an end vehicle coupling defective or damaged, arrangements will need to be made to prevent the train being used on a diagram where it will need to couple to another train. It is recommended that the last journey of the day is to a maintenance depot.

G 5.9.4 If a train is operating with a defective or damaged coupling, consideration may be necessary on how assistance could be arranged if the train failed in service.

G 5.9.5 Drivers and operations' control will need to be aware of defective couplings so that they are aware that the train cannot be coupled to another.

G 5.9.6 If an end coupling becomes defective or is damaged during a journey, it is possible for the train to complete its journeys for the day, but arrangements may need to be made to prevent the train being used on a diagram where it will need to couple to another train.

Definitions

competent person	A person who has passed as being qualified and has the required knowledge and skills to carry out a particular rule, regulation, instruction or procedure.
Defective On-Train Equipment (DOTE)	On-train equipment that: • is not performing its intended safety function, either fully or partly • is isolated • is missing.
DOTE contingency plan	A plan produced by a railway undertaking which sets out the action to be taken when on-train equipment becomes defective on any train or vehicle operated by that railway undertaking, and which meets the requirements of this document.
European Rail Traffic Management System (ERTMS)	Signalling and operation management system encompassing ETCS for control command, and GSM-R for voice and data. It is a system for providing real-time control and supervision of trains, consisting of trainborne, track and lineside equipment. The objective is to enable the operation on compatible signalling systems across European borders.
final journey of the day	A journey at the end of a period of no more than 24 hours from when the defect became apparent, unless unforeseen delays occur.
first suitable station	The next station on a train's journey where passengers can be de-trained.
good practice	A process or method that has been shown to work well; succeeds in achieving its objective(s); is widely accepted; and therefore can be recommended as an approach.
in service	A train is in service from the time it is ready to start a journey until the time it completes its journey. A vehicle is in service when it forms part of a train which is in service.
infrastructure manager (IM)	Has the meaning given to it in the Railways and Other Guided Transport Systems (Safety) Regulations 2006 (as amended), but is limited to those infrastructure managers who hold a safety authorisation issued in respect of the mainline railway. Source: *ROGS*
journey	The route from the starting point of a train (siding, platform or other place) to its planned destination (siding, platform line or other place), or where: • it is required to reverse before continuing to its destination • vehicles are attached or detached • it is terminated short of its destination.

	Any light locomotive movement, empty coaching stock movement or short distance shunting movement is a separate journey from the associated train movement.
maintenance depot	A location identified in the railway undertaking's DOTE contingency plan with the facilities to repair or replace the specified items of defective on-train equipment for that vehicle type.
next available location	The next location on a train's journey where it can be turned, repaired, terminated or re-formed.
out of service [train]	A train is out of service between the time that it completes its journey and the time it is ready to start another journey.
out of service [vehicle]	A vehicle is out of service when it forms part of a train that is out of service, or when it has been detached from a train in a depot, siding, platform line or other authorised place. The detraining of passengers does not in itself mean a vehicle has been taken out of service.
placed out of passenger use	Where vehicles have external and interior doors locked to prevent access by passengers.
railway undertaking (RU)	Has the meaning given to the term 'transport undertaking' in the Railways and Other Guided Transport Systems (Safety) Regulations 2006 as amended, but is limited to any private or public undertaking the principal business of which is to provide rail transport services for goods and/or passengers, with a requirement that the undertaking must ensure traction. Source*: ROGS*

References

The Standards Catalogue gives the current issue number and status of documents published by RSSB. This information is available from http://www.rssb.co.uk/standards-catalogue.

RGSC 01	Railway Group Standards Code
RGSC 02	Standards Manual

Documents referenced in the text

Railway Group Standards

GMRT2131	Audibility and Visibility of Trains
GMRT2176	Air Quality and Lighting Environment for Traincrew inside Railway Vehicles
GMRT2461	Sanding equipment

RSSB Documents

GERT8000	Rule Book
GERT8000-AC	AC electrified lines
GERT8000-S5	Passing a signal at danger or an end of authority (EoA) without a movement authority (MA)
GERT8000-TW1	Preparation and movement of trains
GERT8000-TW5	Preparation and movement of trains: Defective or isolated vehicles and on-train equipment
GERT8000-TW8	Level crossings - drivers' instructions
GMGN2615	Guidance on the Locomotives and Passenger Rolling Stock TSI
GOGN3615	Guidance on the Operation and Traffic Management Technical Specification for Interoperability
	Risk Review of Guidance for Defective on-Train Equipment
RIS-0775-CCS	AWS and TPWS Application Requirements
RIS-2472-RST	Data recorders on trains
RIS-2703-RST	Rail Industry Standard for Driver Only Operated On-train Camera / Monitor Systems
RIS-2730-RST	Vehicle Fire Safety and Evacuation
RIS-2761-RST	Rail Industry Standard for Driving Cabs
RIS-2766-RST	Rail Industry Standard for Wheelsets
RIS-2777-RST	Functionality and Management of Track Circuit Assisters (TCAs) on Rail Vehicles

RIS-3703-TOM	Passenger Train Dispatch and Platform Safety Measures
RIS-3780-TOM	Operational Requirements for GSM-R Radio
RIS-8040-TOM	Low Adhesion between the Wheel and the Rail - Managing the Risk
RSSB-GBMR-OC	Operational Concept for the GB Mainline Railway

Other References

OPE NTSN	Operation and Traffic Management National Technical Specification Notice (OPE NTSN). Published by the Secretary of State on 1 January 2021 pursuant to regulation 3B of the Railways (Interoperability) Regulations 2011. This NTSN replaces and substantially reproduces the provisions of Commission Decision 2012/757/EU of 14 November 2012 (the OPE TSI), and includes relevant amendments made by Commission Regulation (EU) 2015/995 of 8 June 2015 and Commission Implementing Regulation (EU) 2019/773 which came into force in June 2019
LOC & PAS NTSN	Locomotive and Passenger National Technical Specification Notice (LOC&PAS NTSN). Published by the Secretary of State on 1 January 2021 pursuant to regulation 3B of the Railways (Interoperability) Regulations 2011. This NTSN replaces and substantially reproduces the provisions of Commission Regulation (EU) 1302/2014 (the LOC&PAS TSI), and includes relevant amendments made by Commission Implementing Regulation (EU) 2018/868 of 13 June 2018, and Commission Implementing Regulation (EU) 2019/776 which came into force in June 2019
CSM RA	Common Safety Method for Risk evaluation and Assessment
ROGS 2006	The Railways and Other Guided Transport Systems (Safety) Regulations 2006
SI 1997/553	The Railway Safety (Miscellaneous Provisions) Regulations 1997
SI 1999/2244	Railway Safety Regulations 1999