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Level Crossing Operational Interfaces with Trains

Synopsis

This document sets out control, command and signalling requirements and guidance for level crossing functionality, so that it is compatible with infrastructure manager operations at stations and railway undertaking operations.

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Issue Record

Issue	Date	Comments
One	03/12/2016	This new RIS replaces GKRT0192 issue two and its associated guidance note and arises from proposal 14-001 to develop the requirements for level crossings from first principles. This document delivers phase one of this work to reclassify requirements from GKRT0192 that are not national technical rules and therefore out of scope of railway group standards.

This document will be updated when necessary by distribution of a complete replacement.

Superseded Documents

The following Railway Group documents are superseded, either in whole or in part as indicated:

Superseded documents	Sections superseded	Date when sections are superseded
GKRT0192 issue two	ALL	03/12/2016
GKGN0692 issue two	ALL	03/12/2016

Supply

The authoritative version of this document is available at www.rssb.co.uk/railway-group-standards. Enquiries on this document can be forwarded to enquirydesk@rssb.co.uk.

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Part 1 Purpose and Introduction

1.1 Purpose

1.1.1 This document is a standard on level crossing interface requirements, for members of RSSB to use if they so choose.

1.1.2 This document sets out a series of requirements for level crossing equipment so that level crossing functionality is compatible with infrastructure manager (IM) operations at stations and railway undertaking (RU) operations.

1.1.3 This document does not set out any rationale because the requirements in this document are pre-existing requirements that did not have any rationale. Rationale is to be developed to be included in the next issue of this document.

1.2 Application of this document

1.2.1 A member of RSSB may choose to adopt all or part of this document through internal procedures or contract conditions. Where this is the case the member of RSSB will specify the nature and extent of application.

1.2.2 Therefore compliance requirements and dates have not been specified since these will be the subject of internal procedures or contract conditions.

1.2.3 The Standards Manual and Railway Group Standards (RGS) Code does not currently provide a formal process for deviating from a Rail Industry Standard (RIS). However, a member of RSSB, having adopted a RIS and wishing to deviate from its requirements, may request a Standards Committee to provide opinions and comments on their proposed alternative to the requirement in the RIS. Requests for opinions and comments should be submitted to RSSB by e-mail to proposals.deviation@rssb.co.uk. When formulating a request, consideration should be given to the advice set out in the 'Guidance to applicants and members of Standards Committee on deviation applications', available from RSSB's website.

1.3 Health and safety responsibilities

1.3.1 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.

1.4 Structure of this document

1.4.1 This document sets out a series of requirements that are sequentially numbered.

1.4.2 Where relevant, guidance supporting the requirement is also set out in this document by a series of sequentially numbered clauses and is identified by the letter 'G'.

1.5 Approval and Authorisation

1.5.1 The content of this document was approved by Control Command and Signalling (CCS) Standards Committee on 01 September 2016.

1.5.2 This document was authorised by RSSB on 28 October 2016.

Part 2 Requirements for level crossing interfaces

2.1 Train crew operated barrier level crossings

2.1.1 Default position for barriers

2.1.1.1 The default position for barriers at train crew operated barrier level crossings shall be barriers raised.

2.1.1.2 The control of the barriers shall be arranged so that they remain raised if there is a loss of power.

Guidance

G 2.1.1.3 Train crew operated barrier level crossings are typically provided on lightly used lines where minimum signalling facilities and operating conditions are not compatible with the provision of a signaller/ crossing keeper controlled level crossing or an automatic level crossing.

G 2.1.1.4 The barriers are designed so that they do not lower because of a power failure. This type of level crossing is monitored locally by the train crew, which in practice means that barrier failures can only be detected when a train is present.

G 2.1.1.5 Train drivers expect to approach the stop board protecting train crew operated barrier level crossings when the road is open to traffic. If the barriers are already down when the train arrives, the train driver is able to recognise this as an irregularity and report the failure to the signaller in accordance with the Rule Book. Other level crossing failures that occur during operation are indicated to the train driver by the level crossing control and indication facility (see *2.1.2 Provision of control and indication system* on page 7).

2.1.2 Provision of control and indication system

2.1.2.1 A level crossing control and indication facility shall be provided for use by train crew.

2.1.2.2 The control and indication system functionality and interface shall be determined using the process for assessment of compatibility set out in GERT8270 which shall include an assessment of the following:

a) The requirement for train crew to initiate the barriers lower sequence.
b) The requirement for train crew to initiate the barriers raise sequence.
c) The requirement for train crew to stop the level crossing barriers at any position during the lower and raise sequences.
d) The requirement for train crew to observe that the barriers are fully raised.
e) The requirement for train crew to observe that the barriers are fully lowered.
f) The requirement for train crew to observe that the road traffic light signals are operating correctly.
g) The requirement for train crew to detect a loss of primary power supply to the telephone system, where level crossing telephones are provided.

Guidance

G 2.1.2.3 These requirements apply to all train crew operated level crossing control and indication facilities, including:

a) Level crossing control units provided for the train crew to operate the level crossing at ground level.
b) Auxiliary control and indication devices, which may be provided so that train drivers can operate the level crossing from the driving cab.

G 2.1.2.4 The level crossing controls and indications are provided because a member of the train crew (typically a train driver, shunter, or guard, who is an authorised level crossing operator) is responsible for:

a) Operating the level crossing controls to close the road after the train has stopped at the stop board.
b) Checking that the level crossing closing sequence has operated correctly before the train proceeds over the level crossing.
c) Operating the level crossing controls to reopen the road after the train has completely passed over the level crossing, unless automatic controls are provided to do this.
d) Checking that the level crossing opening sequence has operated correctly before the train departs.

G 2.1.2.5 The level crossing control devices are provided so that the road closure and road opening sequences can be activated by the train crew in accordance with the operating instructions published in the relevant operating instructions.

G 2.1.2.6 At least one ground level control unit is provided at each train crew operated barrier level crossing. The barrier raise, lower and stop controls are provided using push button control devices, labelled:

- LOWER: To initiate and restart the barrier lowering sequence.
- STOP: To stop the barriers at any time during the lowering or raising sequence.
- RAISE: To initiate and restart the barrier raising sequence.

G 2.1.2.7 Where an auxiliary control unit is provided using a driver's pull cord, the lower and stop functions are activated by a single pull, for example:

a) First pull: LOWER.
b) Second pull: STOP.
c) Third pull: LOWER.

G 2.1.2.8 Auxiliary control units are not used to initiate the level crossing opening sequence. Automatic raising functionality is provided unless operational requirements are compatible with the use of the ground level control unit to raise the barriers.

G 2.1.2.9 The STOP functionality is designed so that the barriers stop moving as soon as possible after the STOP control has been operated. This is because the train crew are responsible for supervising the safe operation of the level crossing and may have to stop the barriers to avoid striking a road user.

G 2.1.2.10 Where auxiliary control units are provided to support normal operations from the driving cab, a ground level control unit is also provided because it provides a means of controlling the level crossing if the auxiliary control unit cannot be used (for example, during degraded operations).

G 2.1.2.11 The level crossing indications are provided so that the train crew have sufficient information to decide that either:

a) The level crossing has correctly operated.
b) A level crossing failure needs to be reported to the signaller.

G 2.1.2.12 As a minimum, the indications display information about:

a) The correct functioning of the road traffic signals.
b) The detected positions of the barriers (raised and lowered).
c) Power supply status.

G 2.1.2.13 In order to facilitate safe and efficient operations, additional level crossing indications may be provided, either as part of the level crossing control unit or, separately, in association with the level crossing.

G 2.1.2.14 Examples of additional indications provided at train crew operated barrier level crossings include:

a) The driver's level crossing indicator, which is typically provided where a driver's pull cord is provided as the primary method of controlling the level crossing from the driving cab.

b) The barriers up 'BU' indicator, which is provided in connection with the 'auto-raise' functionality.

G 2.1.2.15 Where there is more than one train crew operated barrier level crossing along a line of route, all of the level crossing control devices operate in a similar way and the indications are displayed using a similar format.

2.1.3 Location of control and indication system

2.1.3.1 The level crossing control and indication facility shall be located so that the train crew:

a) Can conveniently operate the level crossing, and
b) Have a clear view of the approaching road traffic and the whole crossing area.

Guidance

G 2.1.3.2 The position of the level crossing control unit takes account of the following:

a) The requirement for the train crew to gain access to the level crossing control unit when the train has arrived at the stop board.
b) The person operating the level crossing having a full view of the level crossing area and all road approaches when the level crossing is operated. This is because the level crossing operator is responsible for making sure that the barriers do not trap road users, and are stopped, if necessary, to avoid striking a road user.
c) Where a driver's white light is not provided, the requirement for the level crossing operator to authorise the train driver to pass the stop board (for example, by displaying a handsignal in accordance with the Rule Book).

G 2.1.3.3 Where an auxiliary control device is provided for the train driver to operate the level crossing without leaving the driving cab:

a) When the train is stationary at the stop board, the train driver has visibility of the level crossing barriers and immediate road approaches.
b) The level crossing indications are displayed using a driver's level crossing indicator.

2.1.4 Security of control and indication system

2.1.4.1 The level crossing control and indication facility shall be secured to prevent unauthorised operation.

2.1.4.2 If an operating device is provided for drivers to operate the level crossing from the driving cab (for example a pull cord), that operating device shall only initiate the closing sequence when a train is detected to be present at the associated stop board.

Guidance

G 2.1.4.3 Ground level control units are secured within a locked cabinet that can only be accessed using a key held by train crew. The instructions for the train crew include:

a) Key management responsibilities.
b) Security of the control unit before, during and after passage of the train.
c) The requirement to secure the control unit after use.

G 2.1.4.4 Where a level crossing can be controlled from the cab using an auxiliary control device (for example, a driver's pull cord), the operation of the pull cord only operates the level crossing when a train is detected to be present. This is because it is not feasible to secure such devices so that they cannot be operated by unauthorised persons.

2.1.5 Provision of barriers up indications

2.1.5.1 Where drivers of departing trains are required to confirm that an automatic raising sequence has correctly operated, Barriers Up (BU) indicators shall be provided.

Guidance

G 2.1.5.2 Train crew operated barrier level crossings can be designed so that the road is reopened automatically when the train is detected to have completely passed over the level crossing.

G 2.1.5.3 The decision about whether or not to provide 'auto-raise' functionality is jointly made by the IM and the relevant RUs, and takes account of:

a) The implications of having to stop each train after it has passed over the level crossing.
b) The effect on road closure time of the time required to manually operate the level crossing opening sequence after the train has passed over the level crossing.
c) The additional complexity associated with automatic raise functionality.

G 2.1.5.4 Where 'auto-raise' functionality is provided, BU indicators are provided if the train crew is responsible for checking that the level crossing has operated correctly to open the road before the train leaves.

G 2.1.5.5 The IM and relevant RUs agree the position of the BU indicators, taking account of maximum train lengths and the requirement for the train driver to stop the train and check that the level crossing opening sequence has operated when the BU indication is not displayed.

G 2.1.5.6 Where trains of varying lengths are operated (for example, short passenger trains and long freight trains), multiple BU indicators may be provided at positions compatible with different train lengths. This is to avoid excessive delay in the event of a level crossing failure if the train crew on a short train have to walk a long way to the level crossing.

G 2.1.5.7 Further requirements for BU indicators are set out in GKRT0045.

G 2.1.5.8 Further guidance about the operational response to BU indications is included in section *3.1.2 Requirements to observe 'Barriers Up' indications* on page 30.

2.1.6 Level crossing operating sequences

2.1.6.1 The level crossing operating sequences shall be as follows:

a) When the closing sequence is initiated, the amber lights of the road traffic signals shall illuminate and the audible warning devices shall begin to sound.
b) After approximately three seconds, the amber lights shall be extinguished and the red road traffic light signals shall begin to flash.
c) Approximately five seconds after the red road lights have commenced to flash, the barriers shall begin to lower.
d) At crossings with four barriers, the entrance barriers shall lower first. The exit barriers shall begin to lower after the entrance barriers have lowered.
e) The audible warning shall cease when all of the barriers are fully lowered.

2.1.6.2 The audible warning parameters set out in *Appendix B Level Crossing Audible Warning Parameters* on page 33 shall be complied with.

2.1.6.3 The level crossing opening sequence shall be as follows:

a) When the opening sequence is initiated, the barriers shall begin to rise simultaneously, and
b) The red road light signals shall be extinguished when all the barriers have risen to an angle of approximately 45° above horizontal.

Guidance

G 2.1.6.4 The level crossing operating sequence is set out in the relevant level crossing order, which is a legal requirement of the Level Crossings Act 1983. The level crossing operating arrangements require the train crew to check that the level crossing operates correctly. This is done by checking the indications and observing the operation of the level crossing equipment during the raise and lowering sequences.

G 2.1.6.5 The general requirements are specified in this standard because, if the level crossing fails to operate correctly, the train driver is responsible for reporting the failure to the signaller.

2.2 Level crossings with gates

2.2.1 Visibility of level crossing gates

2.2.1.1 When level crossing gates are closed across the railway, they shall be visible to drivers when the train has stopped at the stop board protecting the level crossing.

Guidance

G 2.2.1.2 At these level crossings, the gates are painted white and fitted with a red target board so that they are visible to drivers of approaching trains.

G 2.2.1.3 The red target board is not used as a stop board because it does not provide a safe overrun distance to the level crossing. A separate stop signal or stop board is provided on the approach to the level crossing (see *Appendix A Guidance on stop signals protecting level crossings* on page 32).

2.2.2 Default position of gates operated by train crew

2.2.2.1 The default position for level crossing gates operated by train crew shall be closed across the railway.

Guidance

G 2.2.2.2 Train crew operated gated level crossings are typically provided on lightly used lines where minimum signalling facilities and operating conditions are not compatible with the provision of a manually controlled barrier level crossing or an automatic level crossing.

G 2.2.2.3 Train crew operated gated level crossings are protected by stop boards (see *Appendix A Guidance on stop signals protecting level crossings* on page 32). Train drivers expect to approach these level crossings when the road is open to traffic. This means that an irregularity is immediately apparent if the train arrives at the stop board to find that the gates are not closed across the railway.

2.2.3 Operation of level crossing gates by train crew

2.2.3.1 At gated crossings operated by train crew, the gates shall be arranged so that when open to the railway, they close across the road.

2.2.3.2 There shall be a means of securely retaining the gates in both open and closed positions.

2.2.3.3 The means of unlocking or releasing the gates to be closed across the road shall only be available to authorised level crossing operators.

Guidance

G 2.2.3.4 The functionality of level crossing gates is consistent with the instructions for train crew set out in the relevant operating instructions.

G 2.2.3.5 The instructions for the train crew include:

a) Key management requirements.
b) Operation of the gates before and after passage of the train.
c) The requirement to secure the level crossing gates during the train movement and after the road has been reopened.

2.3 Footpath and bridleway level crossings

2.3.1 Audible warning arrangements

2.3.1.1 Where audible warnings are required at footpath and bridleway level crossings and fixed audible warning devices are not provided, the requirement for the train driver to sound the train horn to give the audible warning shall be identified using whistle boards positioned on the signalled approach to the level crossing.

Guidance

G 2.3.1.2 Whereas fixed audible warning devices may be provided at footpath and bridleway level crossings to provide audible warnings of approaching trains, the controls required may mean that provision is not cost effective. As an alternative, a whistle board (the parameters for which are set out in GIRT7033) may be provided on each rail approach to instruct train drivers to sound the train horn. The decision to provide whistle boards takes account of the Rule Book requirements for sounding train horns at night between specified times.

G 2.3.1.3 The following RSSB research reports also provide guidance about audible warnings at footpath and bridleway level crossings:

a) T105 wayside horns at level crossings.
b) T668 Safety benefits provided by train horns at level crossings.
c) T680 Mapping the extent of the train horn problem.
d) T681 Understanding the problems that train horns cause to neighbours.

G 2.3.1.4 Further requirements for whistle boards are set out in GIRT7033.

2.4 Level crossings provided for use by railway staff

2.4.1 Requirements for level crossing instruction signs

2.4.1.1 Instruction signs shall be provided at each level crossing to explain to railway staff how to proceed over the level crossing.

2.4.1.2 Where a level crossing is equipped with a white light visual warning indicator, the instruction sign shall bear the words: ‘Caution – Cross only when light shows’.

2.4.1.3 Where a level crossing is equipped with miniature red/green light units, the instruction sign shall bear the words:

a) ‘If no light – phone crossing operator’ where there is a telephone, or
b) ‘If no light – proceed with caution’ where there is no telephone.

Guidance

G 2.4.1.4 At some locations, the IM may provide a level crossing that is only used by railway staff. Typically, these are provided in connection with:

a) Authorised staff walking routes.
b) Barrow crossings between station platforms.

G 2.4.1.5 At some stations, railway staff may accompany members of the public across a 'white light' staff crossing. The user requirements at these level crossings (including any requirements necessary to provide for accompanied access) is agreed using the process for assessment of compatibility set out in GERT8270. The IM provides signs and, if necessary, other arrangements such as gates, to make it clear that members of the public can only use the crossing when so accompanied.

G 2.4.1.6 Where the crossing users are employed by RUs or other IMs that operate stations, the instruction signs provided on each approach remind railway staff how to cross the line safely and to prohibit use by other people.

G 2.4.1.7 The instruction signs may include:

a) Limitations on the use of the level crossing.
b) Instructions telling users how to contact the signaller, where they are required to do so, before crossing the line.
c) Requirements for users to observe the level crossing warning indications, where these are provided.

G 2.4.1.8 RSSB Research report T332 Understanding the risk at station and barrow crossings, provides further guidance about the provision of staff level crossings at stations.

2.4.2 Requirements for visual warning indicators

2.4.2.1 Where direct observation of approaching trains is inadequate for the safety of users, visual warning indicators shall be provided.

2.4.2.2 The visual warning indicators shall be located at each access point to the level crossing and positioned so that they are visible from a position of safety.

Guidance

G 2.4.2.3 The decision about whether or not to provide visual warning indicators is determined using the process set out in GERT8270 and takes account of the following:

a) The visibility of approaching trains to users before they start to cross the line.
b) The time required for the user to cross the line (see *2.4.7.1* on page 15) relative to the length of time that trains approaching the level crossing are visible from the decision point.
c) The usage of the level crossing (for example, whether equipment or platform trolleys will be taken across the line).
d) The requirement for the user to contact the signaller before crossing the line (see *2.9.3.1 Provision of telephones* on page 25).

G 2.4.2.4 Where provided, visual warning indicators are positioned so that users have visibility of the displayed indication from a position of safety. This is so that users can decide that it is safe to cross the line before gaining access to the railway line.

2.4.3 Intermediate access to the level crossing

2.4.3.1 Where there is intermediate access to a level crossing (for example, from a station platform), the separate sections of the level crossing shall be staggered and each section shall be treated as a separate level crossing.

Guidance

G 2.4.3.2 Typically, where station platforms are located between running lines, a staff crossing may be provided to allow staff to cross over to both sides of the railway. In this case, separate visual indicators are provided with each part of the crossing and positioned so that users are not misled into believing that it is safe to cross the line when a warning indication is displayed.

2.4.4 Visual warning indications

2.4.4.1 Visual warning indicators shall be displayed using either:

a) White light indicators, or
b) Miniature red/green light units.

Guidance

G 2.4.4.2 Visual warning indications at stations are provided using white light indicators. Additional signs are provided to explain to members of the public that the level crossing is only authorised for use by railway staff.

G 2.4.4.3 Miniature red/green light units are not provided at stations because they are sometimes used to display warnings at public level crossings.

2.4.5 White light indicators

2.4.5.1 Where visual warning indications are displayed using white light indicators:

- The white light indication shall be illuminated when it is safe to cross, and
- The indication shall be extinguished when it is not safe to cross

Guidance

G 2.4.5.2 The illumination of the white light provides a positive indication to users that it is safe to cross the line. Absence of the white light means that it is not safe to cross the line, and provides protection if the white light fails.

G 2.4.5.3 The instructions provided to the RUs or IM operating stations explain the meaning of the white light and what to do if no light is shown.

2.4.6 Red/Green Light units

2.4.6.1 Where visual warning indications are displayed using miniature red/green light units:

a) The green light in each unit shall be illuminated when it is safe to cross, and
b) The red light in each unit shall be illuminated when it is not safe to cross.

Guidance

G 2.4.6.2 The provision of a red/green light unit provides a positive indication to users when it is not safe to cross the line and when it is safe to cross the line. If no light is shown, it means that the level crossing is defective.

G 2.4.6.3 The instructions provided to the RUs or IM operating stations explain the meaning of the red/green lights and what to do if no light is shown.

2.4.7 Minimum warning times

2.4.7.1 The level crossing minimum warning times shall:

- Take account of the use of the level crossing
- Be sufficient for a user to traverse the level crossing from the decision point and reach a place of safety at least five seconds before the arrival of a train
- Be a minimum of 20 seconds

Guidance

G 2.4.7.2 The IM providing the level crossing makes sure that the warning time is compatible with the operational use required by the relevant RU or IM operating a station. GERT8270 provides the process for assessment of compatibility to be used.

G 2.4.7.3 The warning time takes account of the following:

a) The time required for the user to cross the line and reach the place of safety.
b) The usage of the level crossing (for example, whether equipment or platform trolleys will be taken across the line).

G 2.4.7.4 The specified 20 seconds minimum warning time takes account of the requirement for a person to walk across two running lines and reach a place of safety five seconds before the train arrives at the level crossing. This time can be extended beyond 20 seconds where the staff level crossing is associated with more than two lines or where equipment is to be taken across the line.

G 2.4.7.5 Where vehicles are to be driven across a staff level crossing, a minimum warning time of 40 seconds is provided. This is compatible with the warning time provided at vehicular level crossings protected using miniature red/green lights.

2.4.8 Configuration of control system

2.4.8.1 The level crossing control system shall be designed to prevent incorrect operation of the level crossing warning indications, resulting from user operations.

Guidance

G 2.4.8.2 Where the staff level crossing warnings are controlled automatically by the occupation of track circuits, the IM assesses the use of the level crossing to identify any circumstances where the user could inadvertently operate the track circuit while crossing the line (for example, using a metal tracked vehicle).

2.4.9 Stop signals between the strike-in point and level crossing

2.4.9.1 Where there is a stop signal between the strike-in point and the level crossing:

a) The level crossing warning shall only be inhibited after a train has passed the strike-in point when the signal is displaying a stop aspect and it is free of approach locking.
b) The clearance of the signal shall be delayed where it is necessary to provide the minimum level crossing warning time (see *A.5 Signal regulation controls at level crossings* on page 33).

Guidance

G 2.4.9.2 When a train is approaching the level crossing, it is not necessary to initiate the level crossing warning if there is a stop signal protecting the level crossing that is displaying a stop aspect.

G 2.4.9.3 This means that users of staff level crossings may observe an approaching train when the level crossing indications show that it is safe to cross the line. Provision of this functionality adds complexity to

the level crossing controls, and special care is required to ensure that the level crossing warnings operate for the required time when a train driver is instructed to pass the signal at danger by the signaller.

G 2.4.9.4 Signal regulation controls are applied so that trains starting from rest at the signal do not arrive at the level crossing before the required warning time has elapsed (see *A.5 Signal regulation controls at level crossings* on page 33).

G 2.4.9.5 The signal regulation controls are applied to all signalled movement authorities over the level crossing, including European Train Control System (ETCS) movement authorities and main, warning, calling-on, shunting and Proceed on Sight Authority (PoSA) class signal routes.

2.5 Automatic level crossings remotely monitored by the signaller

2.5.1 Wrong direction train movements

2.5.1.1 Where wrong direction controls are provided, an automatic level crossing wrong direction speed restriction sign shall be provided on the approach to each wrong direction strike-in point.

2.5.1.2 The indicated wrong direction permissible speed shall be the same for all level crossings on that section of route.

Guidance

G 2.5.1.3 Where bi-directional signalling is not provided, automatic level crossings remotely monitored by the signaller operate normally for signalled (right direction) train movements and un-signalled wrong direction train movements. The automatic level crossing controls for wrong direction train movements take account of the Rule Book, which requires train drivers to control the train at a reduced speed, not exceeding 50 mph, whenever a wrong direction movement is made.

G 2.5.1.4 The wrong direction speed restriction sign provided at each wrong direction strike-in point:

a) Reminds train drivers that the train is approaching an automatic level crossing in the wrong direction.
b) Indicates the train speed that is compatible with the level crossing warning time.
c) Indicates the position of the wrong direction strike-in point, which is required by the driver of a stationary or failed train, who may be required to inform the signaller that the train has passed clear of the strike-in point before a reversing move is made.

G 2.5.1.5 Level crossing warning signs are not provided on the approach to wrong direction speed restriction signs.

G 2.5.1.6 The 50 mph speed limit permitted for wrong direction train movements means that permissible speed warning indicators are not required.

G 2.5.1.7 Because train drivers may make wrong direction movements only infrequently, the wrong direction speeds at automatic level crossings remotely monitored by the signaller are the same along each line of route to avoid confusing the train driver.

G 2.5.1.8 Further requirements for wrong direction speed signs are set out in GIRT7033.

G 2.5.1.9 Further requirements for permissible speeds are set out in GKRT0075.

2.5.2 Bi-directional control resetting times

2.5.2.1 Where bi-directional controls are provided, the directional control resetting times shall be compatible with the time required for trains to pass clear of the opposite direction strike-in point.

Guidance

G 2.5.2.2 In order to avoid spurious level crossing operation, the directional control resetting time is compatible with the time that slow moving trains take to clear the exit side strike-in train detection sections.

G 2.5.2.3 The resetting time is typically two minutes after the track circuit has cleared. However, information from RUs that operate slow moving trains on lines that have a significantly higher permissible speed informs the IM in order to assess whether an extended resetting time is required.

2.6 Automatic level crossings locally monitored by train drivers

2.6.1 Indication that the level crossing is correctly operating

2.6.1.1 The correct operation of the level crossing equipment shall be indicated on each rail approach to the level crossing using either:

a) A driver's level crossing indicator (see GKRT0045), or
b) By exception, a proceed aspect.

Guidance

G 2.6.1.2 The driver's level crossing indicator is used by the train driver for two reasons:

a) The flashing white light indicates that the level crossing equipment has correctly closed the road.
b) The flashing red light identifies the stopping position for the train when the crossing is not operating correctly.

G 2.6.1.3 The Rule Book sets out the particular actions to be taken by the train driver in response to the displayed flashing white or flashing red indication.

2.6.2 Position of driver's level crossing indicator

2.6.2.1 Driver's level crossing indicators shall be positioned either:

a) Approximately 5 m on the approach to the level crossing, or
b) At the relevant stop board, where provided.

Guidance

G 2.6.2.2 Unless a stop board is provided, a driver's level crossing indicator can be positioned 5 m from the level crossing on each rail approach. When the flashing red light is displayed, an approaching train may proceed up to the level crossing, which gives the train driver the best possible view of the crossing area and road approaches when carrying out the rules for proceeding over the level crossing.

G 2.6.2.3 Where a stop board is provided, the driver's level crossing warning indicator may be positioned at the stop board and the flashing red indication may be omitted. In this case, the requirement for the train to stop is displayed by the stop board, which also includes instructions for passing the stop board, including display of a flashing white light. This arrangement avoids the possibility that a train may have to pass the stop board and then stop again at the level crossing if a flashing red light is also displayed.

G 2.6.2.4 RIS-0703-CCS sets out further requirements for driver's level crossing indicators at stop boards, including the requirements for displayed combinations of level crossing indications, Train Protection and Warning System (TPWS) indications and points indications.

2.6.3 Provision of a driver's indicator when there is also a signal

2.6.3.1 Where a driver's level crossing indicator is provided and there is also a signal in close proximity to the level crossing, the signalling system shall be designed to avoid any possibility of confusion between the aspect displayed by the signal and the indication displayed by the driver's level crossing indicator.

Guidance

G 2.6.3.2 Wherever practicable, a signal is not provided between the automatic level crossing speed restriction sign and the level crossing or beyond the level crossing where there is a risk associated with reading through the driver's level crossing indicator.

G 2.6.3.3 Where a signal and a driver's level crossing indicator are both provided on the approach to a locally monitored level crossing, the IM and RUs jointly assess the risk of a train driver misunderstanding the different meanings of a proceed signal aspect and the level crossing indication. Worked signals are interlocked with the level crossing so that signal OFF aspects are only displayed when the flashing white light is also displayed.

G 2.6.3.4 By exception, the driver's level crossing indicator may be omitted if a stop signal proceed aspect is used to indicate that the level crossing is operating correctly. In this case, local operating instructions set out the requirements for passing the red signal aspect when the level crossing equipment fails to operate correctly.

2.6.4 Indication of permissible speeds

2.6.4.1 All trains shall be required to approach the level crossing not exceeding a defined crossing speed(s).

2.6.4.2 Except where a stop board is provided, the crossing speed(s) shall be indicated to the train driver using an automatic level crossing speed restriction sign on each level crossing approach, including wrong direction approaches.

2.6.4.3 The automatic level crossing speed restriction sign shall be located at a point from which:

a) The relevant driver's level crossing indicator is visible to the train driver, and
b) The train driver can observe whether the level crossing is clear.

Guidance

G 2.6.4.4 The special speed restriction sign provided on the approach to automatic locally monitored level crossings is distinctive because train drivers need to understand that the speed sign is associated with the operational rules applicable to a locally monitored level crossing.

G 2.6.4.5 Where a stop board is provided on the approach to the level crossing (typically 50 m / 25 m from the level crossing), all trains are required to stop before passing over the level crossing. In this case, a special speed restriction sign is not required because the train driver is required to check that the level crossing is clear and correctly operating before proceeding.

G 2.6.4.6 The position of the special speed restriction sign relative to the level crossing provides for unobstructed visibility of the driver's level crossing indicator and the level crossing area. This is so that train drivers can check that the level crossing is clear and that the driver's white light is flashing before the train passes the sign. If either the level crossing is obstructed, or the flashing white light is not displayed when the train reaches the sign, the train driver is required to stop the train on the approach to the driver's level crossing indicator.

G 2.6.4.7 Further requirements for automatic level crossing speed restriction signs are set out in GIRT7033.

2.6.5 Distance from the special speed restriction sign to the level crossing

2.6.5.1 The maximum distance from the automatic level crossing speed restriction sign to the level crossing shall be 600 m.

Guidance

G 2.6.5.2 The maximum distance of 600 m from the special speed restriction sign to the level crossing is compatible with the limit of visibility of the level crossing area to train drivers, and the readability of the driver's level crossing indicator.

2.6.6 Selection of permissible speed

2.6.6.1 The crossing speed(s) applicable to each level crossing approach shall be compatible with the requirement for trains to stop before reaching the level crossing if the train driver cannot confirm that it is safe to pass over the level crossing when the train reaches the automatic level crossing speed restriction sign.

Guidance

G 2.6.6.2 The crossing speed displayed on the special speed restriction sign is compatible with the requirement for the train driver to stop the train on the approach to the driver's level crossing indicator if it is not safe to pass over the level crossing.

G 2.6.6.3 The signal spacing braking curves shown in GKRT0075 are used to determine the appropriate level crossing speed that is compatible with the distance between the special speed restriction sign and the driver's level crossing indicator.

G 2.6.6.4 Two differential crossing speeds may be displayed. In this case, the lower speed value is displayed above the higher speed value.

G 2.6.6.5 The crossing speed applicable to each level crossing approach may be different to account for the variations in level crossing visibility, due to line curvature and physical obstructions.

G 2.6.6.6 The train driver may not be able to stop the train before reaching the level crossing if the level crossing becomes obstructed after a train has passed the special speed restriction sign. The risk is considered as part of the assessment associated with the decision to provide a locally monitored level crossing.

G 2.6.6.7 Further requirements for spacing of signalling equipment are set out in GKRT0075.

2.6.7 Maximum level crossing speed

2.6.7.1 The crossing speed shall not exceed 55 mph.

Guidance

G 2.6.7.2 The maximum crossing speed of 55 mph is broadly compatible with the 600 m maximum distance using the signal spacing criteria for passenger trains set out in GKRT0075 Appendix B for level track.

2.6.8 Where there is a signal between the speed restriction sign and the level crossing

2.6.8.1 If there is a signal between the automatic level crossing speed restriction sign and the level crossing, a miniature automatic level crossing speed restriction sign shall be provided at the signal as a reminder of the crossing speed.

Guidance

G 2.6.8.2 The miniature sign is provided to remind the train driver of the maximum speed that the train is permitted to attain when accelerating towards the level crossing after the train driver has been decelerating the train on the approach to a signal.

2.6.9 Provision of level crossing warning signs

2.6.9.1 A level crossing warning sign shall be provided on the approach to the special speed restriction sign or stop board.

2.6.9.2 The position of the level crossing warning sign shall be compatible with:

- The requirement for all trains travelling at the permissible speed to stop before reaching the level crossing if the brakes are applied at the level crossing warning sign, and
- The requirement for all trains to decelerate from the permissible speed to the relevant crossing speed before reaching the automatic level crossing speed restriction sign.

Guidance

G 2.6.9.3 The level crossing warning sign reminds the train driver that the train is approaching a level crossing at which the train may be required to stop.

G 2.6.9.4 The position of the level crossing warning sign has to be compatible with the braking performance of the train so that the train driver can:

a) Decelerate the train to achieve the level crossing speed at the special speed restriction sign.
b) If necessary, stop the train on the approach to the driver's level crossing indicator.

G 2.6.9.5 The signal spacing braking curves shown in GKRT0075 are used to determine the position of the level crossing warning sign based on the permissible speed(s) and the gradient(s) of the line approaching the special speed restriction sign.

G 2.6.9.6 Requirements for lineside signs are set out in GIRT7033. Sign AH03m is applied for right-direction approaches and sign AH04m is applied for wrong-direction approaches.

2.6.10 Operation of audible warning devices

2.6.10.1 At all automatic level crossings, the audible warning (see *Appendix B Level Crossing Audible Warning Parameters* on page 33) shall commence at the initiation of the closing sequence and continue until all approaching trains have passed clear of the level crossing, and the red road lights have extinguished.

Guidance

G 2.6.10.2 If the flashing white light indication is not displayed when the train approaches an automatic locally monitored level crossing, the operating rules may require the train driver to operate a level crossing initiation plunger to restart the level crossing sequence. In this case, the train driver may use the audible warnings to confirm that the closing sequence has restarted. Absence of the correct audible warning is an irregularity that is identifiable by the train driver and reported to the signaller.

2.6.11 Provision for wrong direction movements

2.6.11.1 The arrangements provided for wrong direction movements shall be the same as those for normal direction movements, including:

a) Determination of crossing speed.

b) Provision of automatic level crossing speed restriction signs.
c) Provision of level crossing warning signs.
d) Provision of driver's level crossing indicators.

Guidance

G 2.6.11.2 This requirement makes sure that train drivers experience a consistent method of operation at locally monitored level crossings, irrespective of the direction of the movement or line being used.

2.6.12 Level crossing resetting functionality

2.6.12.1 Whenever timed resetting of the level crossing is initiated, the driver's level crossing indicator shall extinguish the flashing white light 30 seconds before the level crossing warnings displayed to the road user cease to operate.

Guidance

G 2.6.12.2 Locally monitored level crossings incorporate a timed resetting function that causes the level crossing to reopen the road after the train detection system has indicated that the approach track section is occupied for longer than a defined time. This functionality is provided to overcome train detection failures because this type of level crossing is only monitored during the passage of a train, by drivers.

G 2.6.12.3 The level crossing resetting time is set to accommodate the time taken for the slowest train to reach the level crossing after it has operated the strike-in controls.

G 2.6.12.4 In case a train is still approaching when the crossing is reset, the flashing white light extinguishes and the flashing red light reactivates 30 seconds before the level crossing is reopened to road traffic. This provides the train driver with sufficient time to either:

a) Stop the train before reaching the level crossing.
b) Reach the level crossing before the resetting function reopens the road.

G 2.6.12.5 Typical resetting times are:

a) 180 seconds after the approach track section is occupied – flashing white light extinguishes/flashing red light reactivates.
b) 210 seconds after the approach track section is occupied – the level crossing opening sequence is initiated.

2.7 Train crew operation at automatic level crossings

2.7.1 Level crossing initiation plungers and pull cords for train crew operation

2.7.1.1 Where initiation of the closing sequence at an automatic level crossing requires action by the train crew, a level crossing operating device shall be provided (for example a plunger and/or pull cord).

2.7.1.2 The operating device shall only initiate the closing sequence when a train is detected to be present on the relevant approach.

Guidance

G 2.7.1.3 The IM and relevant RUs agree the operating arrangements where train crew are required to initiate an automatic level crossing warning sequence by operating a control device. GERT8270 sets out the process for assessment of compatibility for this.

G 2.7.1.4 Typically, action is required by the train crew to initiate the closing sequence if either:

a) There is a station between the strike-in point and the level crossing, and it is not possible to rely on train detection alone to provide a consistent warning time.
b) The train driver is required to attempt to restart the warning sequence before proceeding over a locally monitored level crossing that has failed to operate.

G 2.7.1.5 The functionality of the level crossing controls are consistent with the operating instructions for train crew set out in the relevant operating instructions.

G 2.7.1.6 The instructions for the level crossing operator include:

a) Key management requirements.
b) The method of operation of the level crossing controls.
c) Requirements for the presence of a train.

G 2.7.1.7 Confirmation that the level crossing has operated correctly is displayed to the train driver using either a proceed signal aspect or a flashing white light indication.

G 2.7.1.8 Where automatic level crossings are initiated by train crew using a control device, written instructions are provided that set out the actions to be taken. Where a stop board is provided, the instructions are included on the stop board.

2.8 Identification of level crossings

2.8.1 Identification of level crossings

2.8.1.1 Each level crossing shall have a locally unique name.

2.8.1.2 Identification signs and labels at the level crossing and in the Sectional Appendix shall use the locally unique name.

2.8.1.3 Signs shall be provided to indicate the name of level crossings, both to level crossing users and to railway staff.

2.8.1.4 In addition to the crossing name, the signs shall show the national grid reference.

2.8.1.5 Where telephones are not provided, the signs shall also show a contact telephone number.

Guidance

G 2.8.1.6 The allocation and display at each level crossing of a unique name, grid location and details of how to contact the signaller, is necessary to support the requirements for communications in the Rule Book.

G 2.8.1.7 The Rule Book requires personnel (including train crew, people who work on stations and authorised users of staff level crossings) to state their location whenever they speak to the signaller via a voice communication system.

G 2.8.1.8 Voice communications may be required in connection with normal operations, or to report failures or in an emergency.

G 2.8.1.9 Further requirements for level crossing identification signs are set out in GIRT7033.

2.8.2 Provision of level crossing information at signal boxes

2.8.2.1 At every control and supervising point, the signal box diagram shall identify the locations of:

a) All controlled and automatic level crossings within its control area.
b) All user worked level crossings with telephones within its control area.

c) Any level crossing, whether within or outside the control area of the control or supervising point, from which control or supervision may be transferred by operation of a closing switch at its usual supervising point.

2.8.2.2 Information shall be available (for example, in the form of a list), to enable the signaller to identify the location of all other level crossings in the control area of the signal box, where these level crossings are not shown on the signal box diagram or its equivalent.

Guidance

G 2.8.2.3 The Rule Book requires personnel (including train crew, people who work on stations and authorised users of staff level crossings) to state their location whenever they speak to the signaller via a voice communication system.

G 2.8.2.4 The information at the control or supervising point is provided so that the signaller can correctly identify which level crossing the caller is speaking from.

G 2.8.2.5 Where level crossing information is provided to the signaller as a list, the information is presented in a logical geographical format that includes the level crossing name, line name, mileage and grid reference.

2.9 General requirements for telephones at level crossings

2.9.1 Provision of telephones at level crossings

2.9.1.1 Appearance of telephones at level crossings

2.9.1.1.1 Telephones for crossing users at a particular level crossing shall all be of the same appearance and operate in the same way.

Guidance

G 2.9.1.1.2 Where a level crossing is provided for use by railway staff, and telephones are provided as part of the system (see *2.8.2 Provision of level crossing information at signal boxes* on page 22), this provides users with a consistent method of contacting the supervising point.

G 2.9.1.1.3 The findings of RSSB research project T818 provide further information and recommendations on the appearance and usability of public telephones at level crossings.

2.9.1.2 Provision of additional telephones at level crossings

2.9.1.2.1 Additional telephones shall be provided at level crossings where they are required for use by authorised railway staff employed by RUs either during normal operations or during failure of level crossing equipment.

Guidance

G 2.9.1.2.2 Where there is a particular requirement for RU personnel or IM personnel at stations to contact the supervising or control point as part of level crossing operations, dedicated railway operational telephones are provided that are separate from telephones provided for use by the general public. This is so that telephones can be conveniently positioned to support the particular railway operational requirement.

G 2.9.1.2.3 The internal and external labelling requirements for railway operational telephones at level crossings are different from the requirements for public telephones (see *2.9.5 Labelling of level crossing telephones used by members of the public* on page 26 and *2.9.6 Labelling of level crossing telephones provided for use by railway staff* on page 26).

G 2.9.1.2.4 There may not be any distinction at the supervising or control point between calls made from a public telephone and calls made from a railway operational telephone at the same level crossing. The telephone labels and the Rule Book set out the requirements for voice communication between a caller and the signaller.

2.9.1.3 General conventions for the positioning of telephones at level crossings

2.9.1.3.1 At level crossings with road traffic light signals, telephones shall be positioned adjacent to the right-hand side light unit.

2.9.1.3.2 At level crossings that do not have road traffic light signals, telephones shall be positioned adjacent to the point of access to the railway.

Guidance

G 2.9.1.3.3 Irrespective of whether dedicated railway operational telephones are provided at a level crossing, in the event of an emergency, a level crossing telephone may provide the quickest way for train crew to contact the signaller.

G 2.9.1.3.4 The position of telephones at footpath crossings should be such as to allow the user to view the running lines while using the telephones. To aid consistency, in circumstances where the railway boundary is remote from the track, consideration should be given to defining the point of access relative to the telephone and signage.

2.9.1.4 Position of telephones provided for use by railway staff at level crossings

2.9.1.4.1 Telephones provided for the use of railway staff shall be positioned so that users can safely operate the crossing controls provided while using the telephone.

Guidance

G 2.9.1.4.2 Where a level crossing is provided for use by railway staff, and telephones are provided as part of the system (see *2.9.3.1 Provision of telephones* on page 25), this enables staff to use the telephone and operate any level crossing controls from a position of safety, authorised walking route or access point.

2.9.2 Provision of telephones at automatic level crossings

2.9.2.1 Telephone communication to the signaller shall be provided at all automatic level crossings that have barriers, except where barriers are retrospectively fitted to an open level crossing and it is assessed that the risk of not providing a telephone is acceptable.

Guidance

G 2.9.2.2 The primary requirement for public telephones at automatic levels crossings is to provide a means for the public user to contact the signaller in an emergency or before crossing the line with animals, or a slow moving vehicle, so that the signaller can stop approaching trains.

G 2.9.2.3 This type of level crossing also has a railway operational telephone to support local control of the crossing during degraded operations.

G 2.9.2.4 Where an open crossing is upgraded to have barriers, each level crossing is subjected to a site-specific assessment to determine any requirement for a telephone. The site assessment may indicate that the non-provision of a telephone does not present any additional risks compared with the pre-existing layout.

G 2.9.2.5 At these type of crossings, the normal operation of the crossing expects the driver to stop short if the level crossing fails to operate correctly; therefore the non-provision of telephones is not considered to

have an impact on crossing safety. Where a telephone is not provided, signs advising users of the telephone number to contact the Railway Authority are provided.

G 2.9.2.6 Irrespective of whether dedicated railway operational telephones are provided at a level crossing, in the event of an emergency, an automatic level crossing telephone may provide the quickest way for train crew to contact the signaller.

2.9.3 Provision of telephones at level crossings used by railway staff, user worked crossings and bridleway level crossings

2.9.3.1 Provision of telephones

2.9.3.1.1 Telephone communication to the signaller shall be provided at all level crossings used by railway staff, user worked level crossings and bridleway level crossings where:

a) The warning time is less than the time needed to cross safely, and
b) No active visible warning is provided.

2.9.3.1.2 Telephone communication to the signaller shall be provided at level crossings where, either:

a) There is known to be regular use by animals on the hoof, or
b) There are more than two running lines.

Guidance

G 2.9.3.1.3 Further guidance about the warning times required at staff level crossings is set out in *2.4.7.1* on page 15.

G 2.9.3.1.4 The primary requirement for public telephones at user worked and bridleway level crossings is to provide a means for the public user to contact the signaller before crossing the line to obtain permission to cross.

G 2.9.3.1.5 Irrespective of whether dedicated railway operational telephones are provided at a level crossing, in the event of an emergency, a footpath or bridleway level crossing telephone may provide the quickest way for train crew to contact the signaller.

2.9.3.2 Position and visibility of telephones at level crossings used by railway staff, user worked level crossings and bridleway level crossings

2.9.3.2.1 Where telephones are provided at level crossings for users, all of the following shall apply:

a) There shall be at least one telephone on each side of the railway line.
b) The telephones shall be clearly visible from the level crossing area.
c) The telephones shall be clearly visible from any sign instructing use of the telephone.

Guidance

G 2.9.3.2.2 Where a level crossing is provided and telephones are provided as part of the system, users locate and use the telephone when standing at the access point before entering the level crossing area.

2.9.4 Provision of telephones at controlled level crossings with automatic lowering functionality

2.9.4.1 Telephone communication to the signaller shall be provided at all controlled level crossings with automatic lowering functionality where there is known to be regular use by animals on the hoof or slow moving vehicles.

Guidance

G 2.9.4.2 The primary requirement for public telephones at this type of level crossing is to provide a means for the public user to contact the signaller before crossing the line with animals, or a slow moving vehicle, so that the signaller can inhibit the auto-lower feature.

G 2.9.4.3 This type of level crossing also has a railway operational telephone to support local control of the crossing during degraded operations.

G 2.9.4.4 Irrespective of whether dedicated railway operational telephones are provided at a level crossing, in the event of an emergency, a level crossing telephone may provide the quickest way for train crew to contact the signaller.

2.9.5 Labelling of level crossing telephones used by members of the public

2.9.5.1 Level crossing telephones shall be clearly signed externally with an identification label to allow a user to identify their function.

2.9.5.2 If any external telephone identification label cannot be clearly seen from all parts of the crossing area, and from any sign instructing users to use the telephone, additional identification labels shall be affixed to the side of the telephone enclosure or its supporting structure.

2.9.5.3 Telephones shall be clearly labelled internally with an information label to instruct the user in their correct use and to give the information likely to be needed in normal and emergency situations.

2.9.5.4 Internal information labels shall provide all of the following:

a) Instructions on how to use the telephone.
b) The name of the control point (for example, signal box).
c) The name of the level crossing.
d) The national grid reference of the level crossing, accurate to 100 m.
e) The public telephone number of a continuously staffed location, to be contacted if the telephone is faulty.

Guidance

G 2.9.5.5 External labels and telephone signs are provided for public telephones and railway operational telephones to help the caller identify the location of the telephone. Callers may include train crew or station staff, particularly in an emergency.

G 2.9.5.6 Internal telephone labels provide the caller with the information required to use the telephone and details about the person they are calling.

G 2.9.5.7 The findings of RSSB research project T818 provide further information and recommendations on the usability of public telephones at level crossings.

2.9.6 Labelling of level crossing telephones provided for use by railway staff

2.9.6.1 Level crossing telephones shall be clearly signed externally with an identification label to allow railway staff to identify their function.

2.9.6.2 Telephones shall be clearly labelled internally with an information label to instruct railway staff in their correct use and to give the information likely to be needed in normal and emergency situations.

2.9.6.3 Internal information labels shall provide all of the following:

a) Instructions on how to use the telephone.
b) The name of the control point (for example, signal box).
c) The name of the level crossing.

d) The national grid reference of the level crossing, accurate to 100 m.
e) The phonetic alphabet.

Guidance

G 2.9.6.4 External labels and telephone signs are provided for public telephones and railway operational telephones to help the caller identify the location of the telephone. Callers may include train crew or station staff, particularly in an emergency.

G 2.9.6.5 Internal telephone labels provide the caller with the information required to use the telephone and details about the person they are calling.

G 2.9.6.6 The information displayed by railway operational telephone labels includes the phonetic alphabet, because the Rule Book requires the use of the phonetic alphabet during operational communications with the signaller.

2.10 Requirements for Automatic Warning System (AWS) at level crossings

2.10.1 Provision of AWS track equipment

2.10.1.1 Automatic Warning System (AWS) track equipment shall be provided on the approach to all distant signals, distant boards and level crossing warning signs associated with signalled movements towards automatic level crossings and level crossings operated by train crew. This requirement does not apply to lines where all trains are operated using ETCS level 2

Guidance

G 2.10.1.2 This requirement clarifies the requirements for the provision of AWS track equipment set out in GERT8075. The position of the AWS track equipment relative to the associated level crossing sign or signal complies with the parameters set out in GERT8075.

G 2.10.1.3 Distant signals, distant boards and level crossing warning signs are typically provided approaching:

a) Automatic locally monitored level crossings.
b) Train crew operated barrier level crossings.
c) Level crossings protected by stop boards.

G 2.10.1.4 There is no requirement to provide AWS track equipment on the approach to level crossing warning signs associated with un-signalled wrong direction movements.

G 2.10.1.5 The AWS track equipment is provided to draw the train driver's attention to the presence of the signs and signals that warn of a level crossing ahead, and which may require the driver to slow down or stop.

G 2.10.1.6 Further requirements for AWS are set out in GERT8075.

2.11 Illumination of level crossings

2.11.1 Provision of level crossings

2.11.1.1 A level crossing shall be illuminated if all of the following apply:

a) Safe operation relies on the train driver seeing that the level crossing is clear.
b) The level crossing is used by road vehicles.
c) Trains run after dark.

Guidance

G 2.11.1.2 Train drivers are required to observe that the level crossing is clear before passing over the following types of level crossings:

a) Automatic locally monitored level crossings.
b) Train crew operated barrier level crossings.

2.11.2 Compatibility with other light sources

2.11.2.1 If the road approaches to a level crossing are illuminated, the level crossing shall be illuminated to at least the same standard.

2.11.2.2 Lighting shall not interfere with the visibility of signals or the train driver's ability to distinguish the signal aspects displayed.

2.11.2.3 Where crossing illumination is provided, it shall not cause glare to the extent that it affects the ability of train drivers to see that the crossing is clear or impair their ability to observe lineside signs and signals after passing over the crossing.

Guidance

G 2.11.2.4 The level of illumination at the level crossing is compatible with the illumination in the surrounding area so that:

a) Authorised level crossing operators have visibility of the level crossing area when the level crossing is being operated.
b) Train drivers have visibility of the level crossing area, relevant signals, indicators and lineside operational signs when the crossing is illuminated.

G 2.11.2.5 The sighting of signals, indicators and lineside operational signs is checked in accordance with RIS-0737-CCS before the level crossing is taken into use.

G 2.11.2.6 At automatic locally monitored level crossings, the visibility of the level crossing area from each level crossing speed restriction sign is checked before the level crossing is taken into use.

G 2.11.2.7 At train crew operated level crossings, the visibility of the level crossing area from each stop board and level crossing control position is checked before the level crossing is taken into use.

2.12 Sighting requirements for indicators and lineside operational signs

2.12.1 Requirement for sighting

2.12.1.1 Driver's level crossing indicators, BU indicators and lineside signs provided on the approaches to level crossings shall be sighted in accordance with RIS-0737-CCS.

2.12.1.2 Where the layout of the level crossing means that a driver could be misled by lights on the road (including the lights on vehicles), provision shall be made to reduce the risk to an acceptable level.

Guidance

G 2.12.1.3 The sighting of lineside operational signs and indicators associated with level crossings is agreed by a signal sighting committee (SSC) in accordance with RIS-0737-CCS, so that train drivers are able to:

a) Locate and read the information displayed by lineside operational signs and indicators during daylight and darkness, and when the level crossing is illuminated.
b) Distinguish railway signs and indicators from road traffic signals, road signs and road vehicle lights.

G 2.12.1.4 At train crew operated barrier level crossings and automatic locally monitored level crossings, the SSC also checks the visibility of the level crossing area from the position that the train driver is required to check the level crossing is clear.

G 2.12.1.5 Where additional screening or adjustment of road traffic signals is necessary, care is required to ensure that such measures do not degrade the visibility of the level crossing indications provided for road users.

2.13 Life cycle management of level crossings

2.13.1 Arrangements for train operations during construction

2.13.1.1 If rail services are not suspended during the period of construction, arrangements shall be made to ensure the safe passage of trains.

Guidance

G 2.13.1.2 Where engineering work is taking place that affects the normal operation of the level crossing from the RU point of view, the IM and RU jointly agree the temporary methods of train working for the period that work is taking place.

G 2.13.1.3 This may include:

a) Alternative arrangements for authorising train movements at level crossings.
b) Application of temporary speed restrictions during the work.

G 2.13.1.4 Where the work could affect the train driver's visibility of the level crossing area, lineside operational signs or indicators, an SSC is convened.

Part 3 Guidance on operational interfaces at level crossings

3.1 Operational interfaces at train crew operated level crossings

3.1.1 Requirements when gates are provided

3.1.1.1 The gates shall be secured across the railway, and the means of unlocking or releasing them to enable them to be closed across the road shall be available only to authorised operators.

Guidance

G 3.1.1.2 *2.2 Level crossings with gates* on page 11 provides further guidance about level crossing gates.

G 3.1.1.3 Train crew are responsible for operating and securing level crossing gates in accordance with local operating instructions, using the mechanism provided.

G 3.1.1.4 Where a gate release key is used to operate the level crossing, the IM and RUs agree the key management arrangements in accordance with GERT8270.

3.1.2 Requirements to observe 'Barriers Up' indications

3.1.2.1 If a BU indication is not illuminated, it shall be necessary for the train to stop and for a member of the train crew to return to the level crossing to raise the barriers using the control unit.

Guidance

G 3.1.2.2 Further guidance about provision of BU indicators is set out in *2.1.5 Provision of barriers up indications* on page 10.

G 3.1.2.3 After the train has passed over certain train crew operated level crossings, the train crew may be required to observe an illuminated BU indication. This is necessary where level crossings do not incorporate a timed resetting control, where a failure of the automatic raising control would cause the road to remain closed after the train had departed.

3.2 Operational interfaces at bi-directional automatic level crossings

3.2.1 Wrong direction controls on unidirectional lines

3.2.1.1 Automatic level crossings provided with wrong direction controls shall be identified in the Sectional Appendix.

Guidance

G 3.2.1.2 The rules in the Rule Book that are applicable to wrong direction train movements depend on whether or not an automatic level crossing is provided with bi-directional controls.

3.3 Investigation of complaints from users of level crossings

3.3.1 Co-operation between the infrastructure manager and railway undertakings

3.3.1.1 Procedures shall be in place to receive complaints from users of level crossings. Complaints shall be investigated to determine any action necessary and the appropriate timescale to provide for continuing safety of the level crossing.

Guidance

G 3.3.1.2 At staff level crossings, the level crossing user may be employed by a RU. The IM has a process to follow up complaints from all categories of level crossing user, including complaints from RUs and IMs that operate stations.

Appendices

Appendix A Guidance on stop signals protecting level crossings

A.1 Stop signals protecting level crossings

A.1.1 On signalled lines, stop signals are used as a means of regulating movement authorities across level crossings. The values in this guidance are available for use in applying the Common Safety Method for Risk Evaluation and Assessment (CSMRA) to control the hazard of a train and a level crossing user being in the level crossing conflict area at the same time.

A.2 Optimum position of stop signals protecting level crossings

A.2.1 Level crossings that have full barriers or gates can trap level crossing users inside the railway boundary. A stop signal is provided at Manually Controlled Barrier (MCB), Manually Controlled Gate (MCG) and Controlled Barrier with Obstacle Detection (CB-OD) crossings to inhibit the movement authority (MA) for the train until the level crossing conflict area is detected to be clear.

A.2.2 At level crossings operated by the train crew, the stop aspect denotes the stopping position for the train so that the train crew can operate the level crossing and confirm that the level crossing conflict area is clear before proceeding. Where a stop board is provided, a driver's level crossing indicator may be used by the train crew to confirm that the level crossing has operated correctly.

A.2.3 For automatic level crossings remotely monitored by the signaller that may not be interlocked with the signal aspect sequence, the previous stop signal provides a means of withdrawing the MA across the level crossing in an emergency. On lines fitted with Radio Electronic Token Block (RETB) signalling, this is the stop board at the nearest token exchange point to the level crossing in each direction. Guidance on RETB is given in GKGN0554.

A.2.4 A stop aspect is provided at automatic level crossings locally monitored by the driver where all trains are required to stop on the approach to the level crossing (for example at a station), or where the available visibility of the level crossing is insufficient to enable a safe crossing speed to be set (see *2.6.6 Selection of permissible speed* on page 19). Guidance to support positioning the stop aspect in these circumstances is provided in this appendix.

A.2.5 Where all trains are required to stop between the strike-in point and an automatic level crossing, the stop aspect indicates the stopping position for the train.

A.2.6 The implications of part of a train being stopped within the level crossing conflict area is a consideration when positioning a stop signal beyond a level crossing, for example at a station.

A.3 Minimum distance of stop signals from level crossings

A.3.1 It has been historical practice to position stop signals at least 50 m from the level crossing, or 25 m where the level crossing is immediately beyond a station platform; however, these distances are not generally applicable due to the variability of level crossing risk, and signal positions need to be assessed on a case-by-case basis. The Signal Overrun Risk Assessment process, as outlined in RIS-0386-CCS, is used to confirm that the position of the signal is acceptable. RSSB research project T1007 has provided an add-on to the SORA Tool in order to assist with the assessment of level crossing signal positioning.

A.4 Maximum distance of stop signals from level crossings

A.4.1 At level crossings where a stop signal is interlocked with the level crossing confict area, it has been historical practice to position the signal no more than 600 m from the level crossing. This distance influences the road closure time, which affect the likelihood of misuse of the level crossing by the public.

This distance also influences the time for a train to travel under caution towards a level crossing under degraded working conditions.

A.4.2 A maximum train running time of 10 minutes at the highest permissible speed has historically been used to determine the maximum distance between a stop signal and an automatic level crossing remotely monitored by the signaller, unless continuous signaller-driver communication is available to enable the signaller to instruct a train to stop before reaching a level crossing, in an emergency.

A.5 Signal regulation controls at level crossings

A.5.1 At automatic level crossings where a stop signal is positioned between the strike-in point and the level crossing, the signalling controls are configured so that accelerating trains do not reach the level crossing before the minimum level crossing warning time has elapsed. This is known as signal regulation.

A.5.2 Where it is necessary to delay the clearance of a stop signal or the display of a flashing white light indication, the required time delay is determined using acceleration data obtained from the relevant railway undertakings. Any calculations are based on the existing or proposed rolling stock which has the best acceleration characteristics.

A.5.3 Signal regulation controls are configured so that the level crossing closing sequence commences when the movement authority is ready to be issued, but before it is displayed. The display of the movement authority is delayed for a predetermined time that is compatible with the shortest time taken for a stationary train to accelerate from the signal to the level crossing. For example:

a) Level crossing warning time - 27 seconds.
b) Shortest time taken for a train to reach the level crossing - 13 seconds.
c) Signal regulation time setting (27-13) - 14 seconds.

A.5.4 Where trains are required to stop between the strike-in point and the level crossing, or where a stop board is provided, the level crossing operating sequence takes account of the time required before the train may be restarted (for example, after token exchange or station duties have been completed).

Appendix B Level Crossing Audible Warning Parameters

B.1 Level Crossing Audible Warning Parameters

B.1.1 Level crossing audible warning devices shall emit a continuous sound comprising repetition of two alternating tones.

B.1.2 The two alternating tones shall have frequencies of 800Hz (+/-10 %) and 1000Hz (+/-10 %) and shall be of equal duration.

B.1.3 The tonal sequence shall repeat approximately every 0.5 second.

B.1.4 When a distinctive tone is required to give warning of a second train approaching the level crossing, the tonal sequence shall alternate at an increased rate of rapidity approximating every 0.25 second.

Guidance

G B.1.5 The audible warning parameters are designed to warn users of approaching trains.

G B.1.6 The distinctive tone associated with a second train is designed to control the risk of users anticipating a level crossing opening sequence when a second train is approaching the level crossing.

G B.1.7 Railway staff may experience level crossing audible warnings during performance of their duties and report any audible warning irregularities to the signaller.

Definitions

Authorised level crossing operator	A person employed by an infrastructure manager or railway undertaking who is specifically authorised to operate level crossing equipment.
Automatic Barrier Level Crossing Locally Monitored (ABCL)	An automatic level crossing with half barriers that relies on the train driver observing that the crossing has operated correctly and is clear of road traffic before traversing.
Automatic level crossing	A level crossing where the warning equipment (for example, barriers and active warnings), is activated automatically by the approaching train in at least one direction. The term excludes a manually controlled crossing where automatic lowering and/or automatic raising of the barriers and/or automatic crossing clear functionality is provided.
Automatic lowering	The automatic lowering of the barriers at a manually controlled level crossing, initiated by a train.
Automatic raising	The automatic raising of the barriers at a manually controlled level crossing, initiated by the passage of a train clear of the level crossing.
Automatic Warning System (AWS)	A system that gives train drivers in-cab warnings of the approach to signals, reductions in permissible speed and temporary / emergency speed restrictions, and to apply the brakes in the event that a driver does not acknowledge cautionary warnings given by the system within the specified time. *from GERT8075*
Barriers lowered	The position of level crossing barriers when the road is closed by the level crossing.
Barriers raised	The position of level crossing barriers when the road is fully open to allow users to traverse the level crossing.
Bi-directional controls	Controls and equipment provided to operate an automatic level crossing correctly when trains approach from either direction, irrespective of whether bi-directional signalling is provided.
Closed Circuit Television (CCTV)	A television system in which the video signal is not publicly distributed but is monitored, primarily for surveillance and security purposes. The monitoring may be undertaken by an operator in real time, or recorded for later analysis in the event of an incident. Equipment that is used for remote monitoring and supervisory purposes, usually at a station platform or Level Crossing.

Closing sequence	The sequence of events, initiated by the signaller or crossing keeper or the approach of a train, which applies the protection to the level crossing to prevent users from crossing the railway.
Closing switch [Level Crossing]	A switch located at a level crossing supervising point which can close while the railway line over the level crossing remains open to train movements. Operation of the switch transfers the level crossing telephones and monitoring circuits to an alternative supervising point. Where the supervising point is a signal box which is provided with a block switch or equivalent for signalling purposes, this device also functions as the closing switch.
Control point [Level Crossing]	The location from which one or more controlled level crossings are operated.
Controlled level crossing	A level crossing protected by signals or stop boards where the passage of each train is the subject of a specific action by the signaller, crossing keeper or train crew.
Crossing speed	The permissible train speed applying between a special speed restriction sign and an automatic locally monitored level crossing.
Degraded mode	The state of part of the railway system when it continues to operate in a restricted manner due to the failure of one or more components.
Level crossing	An intersection at the same elevation of a road, footpath or bridleway and one or more rail tracks.
Level crossing area	The portion of the level crossing between the road stop lines on either side of the railway.
Level crossing warning time	The length of time between the start of the warning sequence provided for users and the arrival of the first train at the level crossing when the train travels at the maximum permissible speed.
Lineside Signalling System	A signalling system that presents information about movement authorities, routes, equipment status, operational information and permissible speeds in the form of lineside displays that are capable of being read, interpreted and acted upon by drivers. The system comprises: a) Signals. b) Route indicators. c) System status indicators. d) Train dispatch system indicators. e) Lineside operational signs.
Movement authority (MA)	The authority given by a signaller (or ground frame operator), issued via the signalling system to the

	driver, which is the authority to move the train within defined limits.
Opening sequence	The sequence of events, initiated by the signaller or crossing keeper or the train clearing the crossing, which withdraws the level crossing protection, allowing users to cross the railway.
Permissible Speed	The authorised maximum speed over a section of line, either for all trains or (where differential speeds are applied) for specific types of trains, as set out in the Sectional Appendix.
Radio Electronic Token Block (RETB)	RETB is a method of protecting a single line of railway through the use of an electronic interlocking and a radio link to the trains which use the line.
Railway staff (user)	A person employed by an infrastructure manager or railway undertaking, acting in accordance with their duties.
Reset (a level crossing)	The action by the level crossing control system of raising the barriers and extinguishing the road traffic light signals after a time delay, following a train detection malfunction.
Signal overrun risk	The safety risk from accidents caused by a train passing a stop signal that is displaying a stop aspect denoting the end of its movement authority. Risk is a combination of frequency and consequence, typically measured in term of fatalities and weighted injuries per year.
Signal Passed at Danger (SPAD)	Signal passed at danger means any occasion when any part of a train proceeds beyond its authorised movement to an unauthorised movement; "unauthorised movement" means to pass - a) A trackside colour light signal or semaphore at danger, order to STOP, where an Automatic Train Control System (ATCS) or train protection system is not operational; b) The end of a safety related movement authority provided in an ATCS or train protection system; c) A point communicated by verbal or written authorisation laid down in regulations; or d) Stop boards (buffer stops are not included) or hand signals, But excludes cases in which - e) Vehicles without any traction unit attached or a train that is unattended run away past a signal at danger; or f) For any reason, the signal is not turned to danger in time to allow the driver to stop the train before the signal.

Signal regulation	The controls applied to delay a proceed signal aspect until the level crossing warning sequence has been activated for a predetermined time.
Strike-in point	The position on the approach to an automatic level crossing or other installation at which a train initiates the warning or closure sequence.
Supervising point	The location from which one or more automatic crossings are supervised to ensure that they are working correctly.
Token Exchange Point (TEP)	A passing loop, station area, siding or portion of line on a railway signalled using the radio electronic token block (RETB) system where trains are permitted to receive, return or exchange electronic tokens.
Train crew	Staff and personnel such as drivers, guards and conductors employed on board a train who have responsibilities for its safe operation on Network Rail managed infrastructure, as defined in the Rule Book GE/RT8000.
Train crew operated barrier level crossing	A controlled level crossing protected by stop boards where the passage of each train is the subject of a specific action by train crew.
Train Protection and Warning System (TPWS)	Train Protection and Warning System (TPWS) is a system mitigating Signals Passed At Danger and non-respect of permissible speeds.
User	A person who uses a level crossing.

References

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

RGSC 01	Railway Group Standards Code
RGSC 02	Standards Manual

Documents referenced in the text

GERT8037	Signal Positioning and Visibility
GERT8075	AWS and TPWS Interface Requirements
GERT8270	Assessment of Compatibility of Rolling Stock and Infrastructure
GIRT7033	Lineside Signs
GKGN0554	Guidance on Radio Electronic Token Block (RETB)
GKRT0075	Lineside Signal Spacing and Speed Signage
RIS-0386-CCS	Rail Industry Standard on Signal Overrun Risk Evaluation and Assessment
RIS-0703-CCS	Signalling Layout Requirements
RIS-0737-CCS (To Be Published)	Signal Sighting Assessment Requirements
T332 (RSSB Research Project)	Understanding the risk at station and barrow crossings
T818 (RSSB Research Project)	Optimising public communication with signallers in emergencies at level crossings
T1007 (RSSB Research Project)	Research into positioning railway signals on the approach to level crossings