

Railway Group Standard

GK/RT0058

Issue One

Date December 2014

Lineside Signal Aspect and Indication Requirements

Synopsis

This document mandates the appearance of lineside signalling system displays and the information they convey.

This document contains one or more pages which contain colour

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Railway Group Standard**GK/RT0058****Issue** One**Date** December 2014**Lineside Signal Aspect and Indication Requirements****Issue record**

Issue	Date	Comments
One	December 2014	Original document. This standard is the result of an analysis of technical compatibility between lineside signalling systems and train operations. The requirements set out in this standard are consistent with the development of products that are capable of being interpretable, which is a pre-requisite of obtaining an authorisation for placing a new or modified lineside signalling system into service.

Superseded documents

The following Railway Group Standard is superseded, either in whole or in part as indicated:

Superseded documents	Sections superseded	Date when sections are superseded
GK/RT0045 issue three Lineside Signals, Indicators and Layout of Signals	2.1.1a; 2.1.1b; 2.1.2; 2.2.1.1; 2.2.1.2a; 2.2.1.2b; 2.2.1.3a; 2.2.1.3b; 2.2.1.4a; 2.2.1.4b; 2.2.1.4c; 2.2.1.4d; 2.2.2.2; 2.2.4.7; 2.2.4.8; 2.2.5.3; 2.2.5.5; 2.2.5.6; 2.2.5.8a; 2.2.5.8b; 2.2.6.1; 2.2.6.5; 2.2.6.6; 2.2.6.9; 2.2.7.2; 2.2.7.5; 2.2.8.3; 2.2.8.5; 2.3.1.1; 2.3.1.5; 2.3.2.5; 2.3.3.2; 2.3.3.3; 2.4.1.2; 2.4.2.2; 2.4.3.2; 2.4.5.2; 2.4.6.5; 2.4.6.6; 2.4.7.3; 2.4.8.2; 2.4.8.7a; 2.4.8.7b; 2.5.1.1a; 2.5.1.1b; 2.5.2.1; 2.5.3.1a; 2.5.3.1b; 4.1.8; 7.1.1; 7.2.1; 7.3.1; 7.3.2	07 March 2015

GK/RT0045 issue three Lineside Signals, Indicators and Layout of Signals, ceases to be in force and is withdrawn as of 07 March 2015.

Supply

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Lineside Signal Aspect and Indication Requirements

Part 1 Purpose and Introduction

1.1 Purpose

- 1.1.1 This document mandates requirements for lineside signal aspects and indications and the information that they are used to convey.

1.2 Introduction

1.2.1 Background

- 1.2.1.1 Lineside signalling systems are provided by infrastructure managers to convey the following types of information to authorised users involved with train operations:
- a) Movement authority information.
 - b) Routing information.
 - c) Permissible speed information.
 - d) Locally monitored infrastructure status information.
 - e) Operating instructions.
- 1.2.1.2 The information is conveyed in the form of signal aspects, route indications, lineside operational signs and other signalling indications. Authorised users read the information being conveyed on the basis of the appearance of what is being displayed.
- 1.2.1.3 This document specifies the appearance and information conveyed by lineside signal aspects and indications so that they are interpretable and therefore compatible with the requirement that an authorised user should be able to understand the information being conveyed.
- 1.2.1.4 The scope of this document does not include compatibility of lineside signal aspects and indications with train driving processes when an in-cab signalling system is in use.

1.2.2 Related requirements in other documents

- 1.2.2.1 The following Railway Group Standard contains requirements that are relevant to the scope of this document:

GK/RT0070 Signalling Layout Design Requirements [in preparation, will replace some parts of GK/RT0045]

GE/RT8102 Signalling Layout Driveability Assessment Requirements [in preparation, will replace some parts of GK/RT0045]

1.2.3 Supporting documents

- 1.2.3.1 The following Rail Industry Guidance Note supports this Railway Group Standard:

GK/GN0658 Guidance on Lineside Signal Aspect and Indication Requirements

1.3 Approval and authorisation of this document

- 1.3.1 The content of this document was approved by Control Command and Signalling (CCS) Standards Committee on 16 October 2014.
- 1.3.2 This document was authorised by RSSB on 24 October 2014.

Railway Group Standard**GK/RT0058****Issue** One**Date** December 2014**Lineside Signal Aspect and Indication Requirements****Part 2 Requirements for Lineside Signal Aspect and Indication Requirements****2.1 Signal aspect and indication appearance**

- 2.1.1 Each lineside signal shall continuously present the relevant signal aspect, except where the signal is configured with approach lighting functionality.
- 2.1.2 A signal shall be configured with approach lighting functionality only if both of the following criteria apply:
- a) The signal does not contribute to the overall readability of signals on other lines.
- And
- b) The relevant signal aspect is readable whenever the signal is approached by a train on the line to which it applies.
- 2.1.3 The interruption of signal aspects and indications that are not designed to flash shall not exceed a single period of 250 mS in any one hour.
- 2.1.4 Signalling information shall be conveyed using only the signal aspects and indications set out in Table 1.

Type of information being conveyed	Conveyed by	Clause or Table reference	
		Individual displays	Display combinations
Movement authority (MA)	Signal aspect	Tables A.1 to A.14	2.2
Repeat MA	Banner repeater indication	Table A.15	Not applicable
Routing	Junction indication	Table B.1	2.3
	Alphanumeric indication	Table B.3	
Repeat routing	Preliminary junction indication	Table B.2	Not applicable
MA + routing	Semaphore junction signal OFF aspect	Tables A.9, A.11 and A.12	2.2
	Flashing signal aspect	Table A.13	Not applicable
	Splitting distant signal aspect	Not applicable	Table A.14
Repeat MA + routing	Splitting banner repeater indication	Not applicable	Table A.16
Locally monitored system status	Coloured light signalling indication	Tables C.1 to C.5	2.4
	Alphanumeric indication		
Operating instruction	Coloured light signalling indication	Tables D.1 and D.2	
	Alphanumeric indication		

Table 1 Displays that convey signalling information

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2.2 Signal aspect and indication combinations

2.2.1 Signal aspect combinations shall be presented only in accordance with Table 2.

Signal aspect type	Display combination requirements
Subsidiary position light signal OFF aspects	A position light signal aspect presented with a colour light signal red aspect or stop board, as set out in A.3, A.4 or A.5.
Splitting distant signal aspects	Two colour light signal aspects presented together, as set out in A.13.
Semaphore main stop and distant signal arm combinations	The distant arm shall: a) Be positioned below the associated main stop arm and on the same signal post. And b) Be presented in the OFF position only when the associated main stop arm is also presented in the OFF position.
Semaphore main and subsidiary signal arm combinations	The calling-on (subsidiary) arm shall: a) Be mounted below the associated main stop arm (and where provided, the associated distant arm), and on the same signal post. And b) Be presented in the OFF position only when the associated main stop arm is in the ON position.
Semaphore junction signal arm combinations	As set out in 2.2.2 and 2.2.3.
Co-acting signal aspects	Duplicated signal aspects.

Table 2 Signal aspects that use display combinations

2.2.2 Semaphore junction signals that convey routing information using stepped, multiple stop arms shall meet the following principles:

- A separate stop arm shall be provided for each route.
- The relative horizontal position of each stop arm shall correspond with the direction of the applicable diverging route relative to the other signalled routes beyond the junction.
- The uppermost stop arm shall apply to the route with the highest permissible speed.
- The relative vertical position of the other stop arms shall correspond with the relative permissible speed on each diverging route.

2.2.3 Semaphore junction signals that convey routing information using stacked, multiple stop arms or discs shall meet the following principles:

- A separate stop arm or disc shall be provided for each route.
- The uppermost stop arm or disc shall correspond with the most extreme left-hand route.

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- c) The relative vertical position of each additional stop arm or disc shall correspond with the extent of the divergence from left to right.

2.3 Signal aspect and route indication combinations

- 2.3.1 Junction signal aspect and route indication combinations shall be presented only in accordance with Table 3.

Junction signal type	Junction signal aspect type	Permitted route indication type
All junction signals	Stop aspect	None (#1)
Colour light signal	Proceed-aspect (#2)	Junction indication
Colour light signal	Proceed-aspect (#2)	Alphanumeric indication
Colour light signal	Proceed-aspect (#2)	Junction indication and Alphanumeric indication
Semaphore signal	Proceed-aspect	Alphanumeric indication (#3)
Independent or subsidiary position light signal	Proceed-aspect	Alphanumeric indication (#3)
#1 See 2.3.2; #2 See 2.3.3; #3 See 2.3.4		

Table 3 Permitted signal aspect and route indication combinations

- 2.3.2 A route indication and stop aspect combination shall be presented only for route indication-proving purposes immediately before the proceed-aspect is presented.
- 2.3.3 A route indication shall not be presented in combination with any of the following signal displays:
- Flashing single yellow.
 - Flashing double yellow.
 - Any splitting distant signal aspect where both signal heads are illuminated.
- 2.3.4 When an alphanumeric route indication is presented by a main stop signal that also incorporates a subsidiary signal aspect (unless the exception set out in 2.3.5 applies):
- The alphanumeric route indications presented with main proceed-aspects shall be displayed in a different position to any alphanumeric route indications presented with the subsidiary aspect.
- And
- Any alphanumeric route indications presented with the subsidiary aspect shall appear to be at least 50% smaller than the alphanumeric route indications presented with the main proceed-aspects.

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2.3.5 A main stop signal shall present alphanumeric route indications that have a similar size and positional relationship with the main and subsidiary aspects only if the following criteria apply:

- a) Physical environment and structure gauge limitations mean that compliance with 2.3.4 is not feasible.

And

- b) A signal sighting assessment confirms that sufficient mitigation will be available to control the risk from a driver misreading the MA.

2.4 Signal aspects and supplementary indication combinations

2.4.1 Signal aspect and supplementary indication combinations shall be presented, only as set out in Table 4.

Signal type	Signal aspect	Permitted supplementary indication	Additional permitted supplementary indication
Stop signal (excluding stop board)	Stop aspect	'TT'	None
All stop signals	Proceed-aspect	‘CD’ or ‘RA’ (#1)	None
		Loading / unloading indication	
		Flashing white light	
Isolated distant signal		‘CD’ or ‘RA’ (#1)	None
Banner repeater	ON aspect	None	
Banner repeater	OFF aspect	'CD' or 'RA' (#1)	None
Stop board (#2)	Stop aspect	Flashing red light	Flashing white light
		Steady yellow light	
		Steady blue light	
		Flashing blue light	
#1 Where both indications are presented at the same signal, the ‘RA’ indication shall supersede the ‘CD’ indication			
#2 The stop board shall also present wording to convey any relevant operating instructions			

Table 4 Signal aspect and supplementary indication display combinations

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Part 3 Application of this document

3.1 Scope

- 3.1.1 The requirements of this document apply to all work that affects lineside signal aspects and indications, whether new or alteration.
- 3.1.2 Where infrastructure is subject to modification or upgrade and the nature of the modification or upgrade provides a reasonable opportunity to bring the infrastructure into conformity, then the requirements of this document applicable to the alteration apply.
- 3.1.3 Action to bring existing lineside signal aspects and indications into compliance with the requirements of this document [or part of document] is not required.
- 3.1.4 Action to bring existing lineside signal aspects and indications into compliance is required when that part of the lineside signalling system is modified or renewed as a whole.

3.2 Exclusions from scope

- 3.2.1 The requirements in this standard are not applicable where an in-cab signalling system is in use.

3.3 General compliance date

- 3.3.1 This Railway Group Standard comes into force and is to be complied with from 07 March 2015.
- 3.3.2 After the compliance date, or the date by which compliance is achieved, if earlier, compliance with the requirements set out in this Railway Group Standard is to be maintained. Where it is considered not reasonably practicable to comply with the requirements, permission to comply with a specified alternative should be sought in accordance with the Railway Group Standards Code.

3.4 Exceptions to general compliance date

- 3.4.1 There are no exceptions to the general compliance date specified in 3.3.
- 3.4.2 It is permissible to designate specific infrastructure projects, at an advanced stage of development when this document comes into force, for which compliance with the requirements of this document applicable to the design, construction and commissioning of new or altered infrastructure is not mandatory. When designating such projects, the following shall be considered:
 - a) Its responsibilities under its current safety authorisation.
 - b) The stage reached by the project at the time this document comes into force (for example, approval in principle).
 - c) Whether compliance is necessary to ensure compatibility with other parts of the infrastructure.
 - d) Whether compliance is necessary to facilitate the safe working of the railway system having regard to changes to related requirements mandated on another infrastructure manager or a railway undertaking.
 - e) The economic impact of compliance, but subject to its current safety authorisation in relation to the infrastructure in question.

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- 3.4.3 Where any designations are made for infrastructure projects, those projects shall continue to meet the equivalent requirements in the RGSSs applying to the project before the designation.

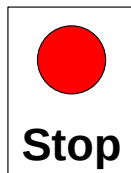
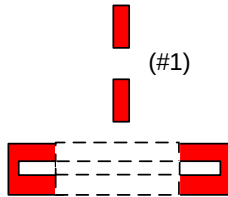
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The content of this appendix is mandatory

A.1 Limit of MA

Conveyed information	Description	Example	Designation
MA information: Limit of MA	Colour light signal head generating the red display		Main stop aspect
	Semaphore main stop arm horizontally aligned (+5°, -5°) and a red signal light		
	Stop board		
	Retro-reflective buffer beam in combination with two buffer-stop lights vertically aligned		
	Independent position light signal generating the PLS red ON display		Shunting stop aspect
	Semaphore miniature stop arm horizontally aligned (+5°, -5°) and a red signal light		
	Semaphore shunting disc horizontally aligned (+5°, -5°) and a red signal light		

#1 Buffer-stop lights coloured either signal red or signal white

Table A.1 Stop aspects