

A long-exposure photograph of railway tracks at night. The tracks recede into the distance, illuminated by a bright light source at the horizon, creating a strong lens flare. The tracks are flanked by trees and a fence. The sky is a deep blue, suggesting twilight. The overall scene is dark, with the primary light source being the distant lights on the tracks.

Control Command and Signalling Glossary

Issue one
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This document defines the meaning of commonly used terms that are specific to signalling or used in a signalling context. The objective is to provide a common and clearly understood meaning of each term.

Control Command and Signalling Glossary

Introduction

There are two sections in this glossary. Section A contains glossary entries from all live CCS standards as of 2021. For entries found in multiple CCS standards, either the most up-to-date definition was selected or entries were combined to provide a more complete definition. Section B (from page 75 onwards) contains entries from the withdrawn GKN0802 issue 1 Glossary of Signalling Terms that are not in the first section. This glossary is arranged in alphabetical order. Acronyms are arranged within the alphabetical list.

Section A

Numbers and characters

100BASE-T

Copper wiring capable of transmitting Ethernet frames at a rate of 1 Gbit/s, as defined by the IEEE 802.3-2015 standard.

10GBASE-T

Twisted pair cables capable of transmitting Ethernet frames at a rate of 10 Gbit/s, as defined by the IEEE 802.3-2015 standard.

10GbE

The generic term for 10 Gigabit Ethernet refers to any use of the 10 Gbit/s IEEE 802.3 MAC (the 10 Gigabit Ethernet MAC) coupled with any IEEE 802.3 10GBASE physical layer implementation.

3GPP

Third Generation Partnership Project – standardisation structure producing UMTS specifications (UTRA FDD and TDD modes, including TD-SCDMA) and GSM evolution (including GPRS and EDGE).

A

A_NVMAXREDADH1, A_NVMAXREDADH2, A_NVMAXREDADH3

Maximum deceleration, assumed by the ETCS braking model, under reduced adhesion conditions.

A_NVP12

Lower deceleration limit used by the ETCS braking model to determine the set of Kv to be used.

A_NVP23

Upper deceleration limit used by the ETCS braking model to determine the set of Kv to be used.

absolute block section

The line between the last stop signal (that is to say, the section signal or intermediate block home signal) controlled from one signal box to the first stop signal (that is to say, the home signal) controlled by the next signal box in the same direction of travel. The section signal OFF aspect is the authority to enter the block section.

accident

An unwanted or unintended sudden event or a specific chain of such events which have harmful consequences; accidents are divided into the following categories: collisions, derailments, level-crossing accidents, accidents to persons caused by rolling stock in motion, fires and others. Source: *Railway Safety Directive*

accreditation [of an assessment body]

Defined in Article 2 of Regulation (EC) No 765/2008 and referenced in the revised regulation (402/2013):

‘An attestation by a national accreditation body that a conformity assessment body meets the requirements set by harmonised standards and, where applicable, any additional requirements including those set out in relevant sectoral schemes, to carry out a specific conformity assessment activity.’ Source: *CSM RA*

accuracy

The degree of conformance between the measured position at a given time and its true position at that time.

Acoustic Axle Bearing Monitoring (AABM)

No definition.

acrylonitrile butadiene styrene (ABS)

No definition.

Action Levels (AL(s))

No definition.

actors

All parties which are, directly or through contractual arrangements, involved in the application of the CSM RA Regulation. Source: *CSM RA*

address resolution protocol (ARP)

No definition.

administrative communication domain (ACD)

All communications and systems that support railway administrative communications.

advisory information

Information or recommendations displayed by C-DAS that assists drivers in meeting the current timetable and improving energy efficiency.

aerial

A tuned metal conductor which is used by either a radio transmitter or receiver to propagate or detect an incoming radio signal. Also referred to as the antenna.

alert

An audible prompt given to the driver of a train by a supervision system to indicate to him that a specified event has been detected.

alternating current (AC)

No definition.

American Standard Code for Information Interchange (ASCII)

A set of digital codes representing letters, numerals and other symbols widely used as a standard format in the transfer of text between computers.

amps (A)

No definition.

Annetts key

A key used on RETB operated lines to enable the user of a ground frame to unlock a lever, to control the movements of points under local supervision.

antenna

That part of a radio transmitting or receiving system which is designed to provide the required coupling between a transmitter or a receiver and the medium in which the radio wave propagates.

Note: In practice, the terminals of the antenna or the points to be considered as the interface between the antenna and the transmitter or receiver should be specified.

Note: If a transmitter or receiver is connected to its antenna by a feed line, the antenna may be considered to be a transducer between the guided waves of the feed line and the radiated waves in space. Source: *IEV 712-01-01*

AOCL[B]

An AOCL crossing that has had barriers fitted at a later date.

appearance [signalling system displays]

The visible characteristics of each type of lineside signalling hardware and signalling system display.

applicable timetable

The Working Timetable for a set of services overlaid by Short Term Planning updates, as agreed between the infrastructure manager (IM) and railway undertaking (RU) as the basis of operations for the following day.

applicant [Railways (Interoperability) Regulations 2011 (as amended)]

The party responsible for seeking an authorisation from the Office of Rail and Road (ORR), to place new, upgraded or renewed infrastructure or vehicle into service.

approach controlled aspect

A signal aspect that is maintained at red (MAR) until an approaching train is detected to have passed the previous signal and, where relevant, is assumed to have reached a predetermined distance from the signal or reduction in train speed.

approach locking

The locking of any route from a signal, when the driver has seen or may have seen a proceed aspect at the signal or has seen an aspect at a previous signal that would indicate to the driver that the former signal is displaying a proceed aspect. If the signal is replaced to danger, the approach locking prevents the immediate release of the route because it is possible that an approaching train may be unable to stop.

arming frequency

A frequency generated by the TPWS track sub-system which, when detected by the vehicle, arms the train sub-system.

as low as reasonably practicable (ALARP)

The concept of the requirement to reduce risk to a level that is 'as low as reasonably practicable' (ALARP), given the time, effort and cost of the control measures required. This is similar to the term SFAIRP, which is the term used in the Health and Safety at Work etc. Act 1974 and which places duties on employers in the UK to ensure safety 'so far as is reasonably practicable' (SFAIRP). Although SFAIRP and ALARP are different in law, they are used interchangeably in the GB rail industry and are regarded as representing the same health and safety legal test.

assessed speed

The maximum speed that a particular category of train will approach a lineside signalling asset, taking account of the information available to the driver (for example, the signal aspect sequence).

Assessment Body

The independent and competent external or internal individual, organisation or entity which undertakes investigation to provide a judgement, based on evidence, of the suitability of a system to fulfil its safety requirements. Source: *CSM RA*

asset configuration

The designed configuration of a lineside signalling asset, including:

- a) asset element type(s)
- b) layout and alignment of asset elements
- c) position of the asset relative to the line
- d) position of signalling displays presented by the asset
- e) structure.

asset element

A part of a lineside signalling asset (for example, a junction indicator).

assets

Mainline vehicles or infrastructure.

Assisted GNSS (A-GNSS)

No definition.

ATO over ETCS (AoE)

No definition.

attainable speed

Taking account of a train's acceleration performance, the assessed maximum speed that a train can achieve over a specific section of line, where this is less than or equal to the permissible speed.

augmentation

Techniques which enhance the performance of the basic GNSS system in some way. Typically, this will involve the monitoring of satellites over a ground-based reference network in order to provide a user with correction messages which can be used to improve position accuracy.

Authentication Header (AH)

No definition.

authorised level crossing operator

A person employed by an infrastructure manager or railway undertaking who is specifically authorised to operate level crossing equipment.

authorised person

A person authorised to carry out one or more duties set out in a safety management system.

authorised railway personnel

A person employed by a railway undertaking or infrastructure manager who is specifically authorised to operate signalling equipment.

authorised user

A competent person who is responsible for an operational role that includes reading and interpreting the information displayed by the lineside signalling system. The operational roles are defined in GERT8000 Rule Book.

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 an approaching train.

Automatic Power Control (APC)

No definition.

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 route setting (ARS)

A system for setting routes without the action of the signaller, based upon a stored timetable, train running information, defined priority, selection criteria and operating algorithms.

automatic train protection (ATP)

A system that continually checks that a train does not exceed the permitted speed or distance allowed by the signalling system.

Automatic Train Supervision (ATS)

No definition.

Automatic Vehicle Identification (AVI)

No definition.

autotransformer feeder (ATF)

No definition.

autotransformer (AT)

No definition.

Auxiliary Converter Module (ACM)

No definition.

auxiliary token instrument

A supplementary token instrument located outside [or away from] the signal box and used by railway undertaking personnel to facilitate prompt token exchange. An auxiliary token instrument located at a ground frame on single lines allows the token to be returned to the system when a train has been shut-in at the ground frame. This allows further tokens to be issued by the controlling signal boxes and hence trains to use the single line. Conversely, it allows a token to be withdrawn (with the co-operation of the signallers) to allow the ground frame to be operated and the previously shut-in train to depart.

availability

The ability of an item to be in a state to perform a required function under given conditions at a given instant of time or over a given time interval, assuming that the required external resources are present. Source: *BS EN 50129:2003*

axle counter system

A type of train detection system in which track-mounted equipment counts axles entering and leaving a track section at each extremity. This information is evaluated to determine whether the track section is occupied or clear.

axle-to-axle voltage

Voltage generated by a train and appearing between any two axles of the train.

B

back office

Database and supporting system to capture data from monitoring and information systems and make it available to other parties.

balise

A track mounted spot transmission unit that uses transponder technology. Its function is to transmit/receive messages to/from the train passing overhead.

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.

barrier

A technical, operational or organisational risk control measure outside the system under assessment that either reduces the frequency of occurrence of a hazard or mitigates the severity of the potential consequence of that hazard. Source: *CSM RA*

An alternative term for barrier is 'boom'.

base transceiver station (BTS)

No definition.

baseline response time (BRT)

The minimum time value that can be used by the SSC to specify the MRT for a particular signalling asset type.

baseline

A set of specifications that forms a recognised legal version of ERTMS/ETCS.

basic service set (BSS)

No definition.

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.

black bond

A current carrying bond, connecting cross bonding to the running rails, or connecting running rails to structures.

blanket speed restriction

A speed restriction, applied to account for environmental conditions, which is not published but is notified to drivers by Operations Control via the signaller or by other means. Lineside signage is not provided, and stop and caution procedures do not apply. A single speed value applies, and the restriction may apply only to selected train types (that is, not to all train types).

block marker

A sign provided for the information of drivers on ERTMS signalled lines. It indicates a location designated as an 'End of (Movement) Authority' when trains are operating in degraded mode.

block section

A section of line that is operated in accordance with the relevant signalling regulations, either between two signal boxes, between a signal box and a token control point worked by train crew, or by one signal box (intermediate block section only). A block section extends from the section signal of the sending signal box or token control point to the first home signal of the next signal box or token control point.

blocking

The blocking characteristic of a receiver is a measure of the receiver's ability to receive a wanted signal at its assigned channel frequency in the presence of an unwanted interferer on a frequency (or frequencies) other than those of the adjacent channels.

Border Gateway Protocol (BGP-4)

A protocol used for routing on the internet.

bow tie model

An approach identifies the direct relationship between objectives, outcomes, hazards, causes and consequences. Controls are used to display what measures are in place to prevent the causes and mitigate the consequences.

brake position [passenger or goods]

Corresponds to the brake cylinder application and release timings selected on the automatic air-brake distributors. See GMRT2045 Issue 4 Appendix J for further details.

Bridging Access Point (BAP)

No definition.

British Rail (BR)

No definition.

British Standards (BS)

No definition.

broadband wireless access (BWA)

Wireless technology based on IEEE 802.x standards offering an alternative to wired 'last-mile' access links for broadband voice, data and video.

broadband

The original communications context of broadband refers to the use of a wide range of transmission frequencies, often with data transmission split over several different frequencies, in order to improve the overall transmission rate. As broadband technologies usually result in higher speed communications, the term has become generally (mis-)used to refer to higher speed communication, without regard to how this is achieved.

buffer stop

An assembly provided at the end of a terminal track which is designed to arrest a rail vehicle. This will be designed to accommodate the impact of a train at buffer or coupling height and up to a set speed.

C**cab display unit (CDU)**

A device for use in the driving cabs of traction units, on board road vehicles and at the trackside, which enables the user to receive and return coded electronic tokens, and to display electronic tokens issued to it. The CDU may be transportable, or mounted in the driving cab of a traction unit.

cab identification

The unique identification code that identifies each cab, where a vehicle or train set has more than one driving cab, for example cab A, or cab B.

cab signalling system

A type of signalling system that presents information about movement authorities, routing, equipment status, operational information and changes in permissible speeds using in-cab displays.

cab signal

Provision of in-cab movement authority and speed limit information to the driver of a train, instead of using lineside signals and signs.

cab vision plot

A means of identifying the restrictions to view imposed on a driver by the cab structure.

cable

An insulated current carrying conductor or conductors.

call type (CT)

A prefix of one or two digits used to distinguish between the different types of User Numbers that are allowed within the national EIRENE numbering plan. It is an indication to the network of how to interpret the number dialled. The types are defined in UIC SRS 16.0.0. Table 9-1.

caller line identification presentation (CLIP)

A service that enables the telephone number of the caller as well as date and time of call to be shown on the screen of the subscriber terminal equipment.

caller line identification (CLI)

Allows the person receiving the call to see the caller's number.

cant deficiency

The difference between actual cant and the theoretical cant that would have to be applied to maintain the resultant of the weight of the vehicle and the effect of centrifugal force, at a nominated speed, such that it is perpendicular to the plane of the rails.

cant

Expressed as the design difference in level, measured in millimetres, between rail head centres (generally taken to be 1500 mm) of a curved track.

capacity

The throughput required expressed in bits per second (mean and peak).

Note: The capacity requirement for a communications service is not necessarily the sum of the capacity requirements for each of the applications that uses the service. For example, the applications may not all be simultaneously active. Short-term overloads may also be acceptable. These result in delays, but as long as the delay does not exceed the limit given by the reliability requirement, the delay should be acceptable. In practice, reliable operation is normally only guaranteed if the mean network capacity is significantly greater than the mean application requirement. As a 'rule of thumb', the mean network capacity should be twice the mean application capacity requirement.

Castell key

A key used on RETB operated lines to lock/unlock the cabinet, fitted to locally supervised ground frames, which houses the Annetts key.

Catalogue of Lineside Signs

A collection of design specifications for lineside signs. Each individual specification is assigned a unique identifier and records issue number and date separately.

catastrophic accident

An accident typically affecting a large number of people and resulting in multiple fatalities. Source: *CSM RA*

catch handle

A handle on a mechanical lever attached to a latch which holds the lever in a specific position within the Lever Frame, usually at the normal or reverse positions.

cathode ray tube (CRT)

No definition.

cautionary aspect sequence

One or more cautionary aspects displayed by the main signals on the immediate signalled approach to the limit of MA.

cautionary aspect

A type of main proceed aspect that conveys information relevant to the limit of MA ahead of the train.

CCS equipment

The component parts that, when correctly connected together and operated within designed parameters, make up a control, command and signalling (CCS) system.

CCS system

Made up of the CCS structural subsystem as defined in the CCS NTSN and the national systems in GB that are necessary to ensure the safety and the command and control of movements of trains.

CDMA2000

3G technologies evolved from CDMA (IS-95) – also known as CDMA MC (multi carrier). A 'family' of technologies, namely 1xRTT (using 1.25 MHz duplex channels), 1xEV-DO and 1xEV-DV. Multi-carrier solutions (for example, 3xRTT) are included in principle, but not currently pursued.

Ceiling Speed Monitoring (CSM)

ETCS Ceiling Speed Monitoring.

ceiling speed

A predetermined speed value, applicable during ceiling speed monitoring, above which a train would trigger an ERTMS/ETCS overspeed warning.

cell

A basic unit to define the shape of DMI objects and the proportions of areas. Depending on the resolution of the total image display area, a cell can consist of one or more pixels.

Certificate Revocation List (CRL)

No definition.

certificate signing request (CSR)

No definition.

certification body

A body responsible for the certification of entities in charge of maintenance, on the basis of the criteria in Part 3 of Schedule 10 of ROGS.

Change of Traction System (CTS)

No definition.

circuit switched data (CSD)

No definition.

circular disc

A circular image filled with one colour.

Class B systems

Existing non-ETCS national signalling systems.

Note: For list of Class B systems, see European Union Agency for Railways technical documents *List of CCS Class B systems, ERA/TD/2011-11, version 3.0*.

classless inter-domain routing (CIDR)

No definition.

clear to send (CTS)

No definition.

clearance point (CP)

The position at which an infrastructure based train detection system will detect that a rail vehicle with the maximum nose overhang is clear of the fouling point of any adjacent tracks including any assessed safety margin.

clearances

The calculated distance between moving vehicles and fixed structures or between two moving vehicles on adjacent tracks. The requirements are contained in GERT8029.

close doors indicator (CD)

An indication that station work is complete and power operated doors on trains may be safely closed.

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[n electrical] switch located at a level crossing supervising point [location] 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 this supervising point is also provided with a block switch or equivalent for signalling purposes, this device also functions as the closing switch.

Code Division Multiple Access (CDMA)

No definition.

code of practice

A written set of rules that, when suitably applied, can be used to control one or more specific hazards. Source: *CSM RA*

Combined Positioning Alternative Signalling System (COMPASS)

No definition.

commercial off-the-shelf (COTS)

No definition.

Common Interface File (CIF)

Contains timetable data published by Network Rail which is transferred electronically from central train service database to other computer systems that require such information.

Common Safety Method for Risk Evaluation and Assessment (CSM RA)

Commission Implementing Regulation (EU) No 402/2013 on the common safety method for risk evaluation and assessment.

Common Safety Method (CSM Safety)

No definition.

communications management unit (CMU)

A standard unit that manages data communications on the train. It is the gateway between the on-train environment and the outside world and provides important communications management functions for the on- train network. It also has an important security role to play, protecting the on-train environment from external communications security threats and protecting important data when it is exchanged with external systems.

compatibility factor

A factor presented within the railway, its environment or its operational context that has the potential to adversely affect the risk arising from the hazard: Incompatibility of a lineside signalling asset with train operations.

compatibility

An ability of two or more subsystems, or parts of them, which have at least one common interface, to interact with each other while maintaining their individual design operating state and their expected level of performance.

competent person

A person who has passed as being qualified and has the required knowledge and skills to carry out a particular rule, regulation, instruction or procedure.

complex asset

A lineside signalling asset made up of multiple asset elements that generate a display combination (for example, a signal aspect and route indication, splitting distant signal aspect).

computer based interlocking (CBI)

A second generation processor based system for controlling the interlocking between points and signals, as well as communication with lineside signalling functions.

concept compatibility

The extent to which signal aspect or indication appearance faithfully represents (or symbolises) the information being conveyed.

conductor

A wire or combination of wires not insulated from one another, suitable for carrying an electric current. Source: *IEV 466-01-15*

conflict point

The first location beyond a signal at which a collision could occur.

conformity assessment body

A body that performs conformity assessment activities including calibration, testing, certification and inspection. Source: *Article 2 of Regulation (EC) No 765/2008 Article 2 of Regulation (EC) No 765/2008*

connected train identifier (CTI)

No definition.

continuity of service

The maximum permitted outage during a stated measurement period. This metric is appropriate for data streaming applications (for example real time CCTV) and may also be used to place an upper bound on the accepted length of a communications service outage within an overall availability requirement.

Control Command and Signalling (CCS) trackside subsystem (CCT)

No definition.

Control Command and Signalling (CCS)

No definition.

Control of Electromagnetic Fields at Work Regulations (CEMFAW Regulations)

Control of Electromagnetic Fields at Work Regulations 2016.

control point [level crossing]

The location from which one or more controlled level crossings are operated.

controlled level crossing

A level crossing equipped with signals or stop boards for trains, and gates or full barriers for cars; where the passage of each train is the subject of a specific action by the signaller, crossing keeper or train crew.

controlled reception pattern antennas (CRPA)

No definition.

Controller Area Network (CAN)

No definition.

controlling signal box

The signal box which oversees the releasing of the ground frame.

converging junction

One or more trailing points within a signal section where trains can be routed from alternative lines towards a common destination.

Correct Side Door Enable (CSDE)

A protective system for door control.

coupling operation

The process of connecting multiple rail vehicles together so that they can operate as a single train.

critical accident

An accident typically affecting a very small number of people and resulting in at least one fatality. Source: *CSM RA*

crossing speed

The permissible train speed applying between a special speed restriction sign and an automatic locally monitored level crossing.

current schedule

The currently planned sequence of named locations, corresponding times and path for a single train service, as per the planned schedule together with any schedule updates. The time specified will be arrivals and departures for scheduled stops, and passing times for non-stopping locations. Schedule data will also include running line and schedule timing tolerances.

customer experience

The service as experienced by the customer from initial discovery, through use of the service, its performance and seeking help and support in the event of problems.

customer

The generic term for any organisation that purchases, or seeks to purchase products. The term is used to cover all of the following: end user, client, buyer, purchaser and procurer.

D

D_NVOVTRP

An ETCS variable that is used for setting the Maximum distance for overriding an ETCS train trip.

D_NVPOTRP

An ETCS variable that is used for setting the Maximum distance for reversing in ETCS Post Trip mode.

D_NVROLL

An ETCS variable that is used for setting the Roll away distance limit.

D_NVSTFF

An ETCS variable that is used for setting the Maximum distance for running in ETCS Staff Responsible mode.

data link module (DLM)

No definition.

Data Recording and Corrective Action System or Defect Reporting Analysis and Corrective Action System (DRACAS)

A formal closed loop corrective action process that is used to continually monitor a system, in order to continually improve quality of service and system reliability.

dBd

Decibels gain referred to the gain of a dipole antenna. The dipole is a practical antenna which has some directionality and hence gain, compared with a theoretical antenna which radiates equally in all directions around a sphere. The peak gain of a dipole antenna is 2.15 dBi higher than the gain of an isotropic antenna (or equivalently, 0 dBd = 2.15 dBi).

dBi

Decibels gain referred to the gain of an isotropic antenna. The isotropically radiating antenna is an antenna which radiates equally in all directions around a sphere and exists only as a theoretical concept. The isotropic antenna has unity gain in all directions and hence 0 dBi = -2.15 dBd. This results in a gain measured in dBi having a numerically larger figure than a gain measured in dBd.

DC electrified lines

Lines equipped with DC electrification, whether or not the line is also equipped with AC electrification.

dead reckoning (DR)

Dead reckoning improves availability, that is, reduces service gaps, due to poor satellite visibility. It can use tachometry, speed sensors (such as Doppler) and directional information (say, a compass), together with a form of map.

defect

Any fault(s) in a component, or assembly, which may prevent the component, or assembly, from fulfilling its design purpose.

defined protection area

The defined area within which users are to be provided with protection by the signalling lockout system.

Degraded Mode Working System (DMWS)

A system that enables trains to continue to move when the normal signalling system is degraded.

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.

degraded

The equipment is configured in an alternative arrangement to permit continued operation of the system. This may be required under conditions such as system faults and when undergoing maintenance activities. Degraded modes of operation include circumstances where one of the feeding transformers has failed or is unavailable and the remaining transformer is used to power both the up and down line and when both supplies to a feeder station are unavailable and the adjacent feeder station is used to provide power to the lines up to the faulty feeder station.

demilitarised zone (DMZ)

A physical or logical subnetwork that contains and exposes external-facing services to a larger and untrusted network, usually the Internet. The purpose of a DMZ is to add an additional layer of security to a local area network.

denial of service

The deliberate interference with a communication facility that prevents its use.

Department for Transport (DfT)

No definition.

depot or yard

In the context of shunters' releases, a set of one or more sidings controlled by a railway undertaking.

depot test unit (DTU)

No definition.

depot

A building or buildings in which train maintenance, servicing or repair takes place. This also includes any sidings within the depot boundary.

design life

The total time or distance over which a wheelset is intended to provide a defined standard of performance while subject to a pre-defined regime of maintenance, repair and overhaul.

Designated Body (DeBo)

Independent third parties appointed by the Secretary of State to assess and verify conformity of projects with National Technical Rules (NTRs) in the United Kingdom. They operate in tandem with Approved Bodies which assess and verify conformity with National Technical Specification Notices (NTSNs).

detection

The proof (electrical or mechanical) that points or signals have responded correctly to any control command.

detect

The initial part of the reading process when an authorised user observes a visible signalling system feature without necessarily being able to identify that it is applicable or distinguish what is being displayed.

diagram

A representation of the track layout and signals controlled from the ground frame to permit correct orientation of the operator to the equipment being controlled.

Differential Global Navigation Satellite System(DGNSS)

No definition.

differential speed

A value of permissible speed or speed restriction that is only applicable to certain trains.

Differential speeds include:

- a) Standard differential speed – Two values of permissible speed, or two different speed values for a temporary speed restriction, each of which is applicable to one of two standard categories of trains, as defined in the Rule Book.
- b) Non-standard differential speed – A permissible speed for a specific type of train, which is different from that for other types of trains on the same section of line. This comprises ‘Permissible speed indicators with letters’ and ‘Enhanced permissible speed indicators’ as described in the Rule Book. Non-standard differential speeds are not applicable to temporary or emergency speed restrictions.

Digital Audio Broadcasting (DAB)

No definition.

Digital Broadband Wireless Technology (DBWT)

No definition.

dilution of precision (DOP)

No definition.

diplexer

A passive device that implements radio frequency domain multiplexing. Two ports (A&B) are multiplexed onto a third port (C). The signals on A&B occupy disjoint frequency bands and can coexist on C without interfering with each other.

direct current (DC)

No definition.

directly opposing locking

Interlocking between two opposing signals.

display [noun]

The overall appearance of the image generated by a product or feature, which is at lineside or in-cab.

display area

A zone displaying a piece of visual information and defined by a size (in cells) and a position relative to the positions of the other display areas.

display element

A single light source or group of light sources that make up all or part of a signal aspect or indication. For example, a junction indicator may comprise five display elements, each comprising one or more light sources.

distant signal

A signal (not itself a stop signal) capable of displaying a cautionary aspect that informs the driver of the state of the signals or level crossing ahead.

distinguishable

The extent to which a signal aspect, indication or sign is capable of being distinguished, ranging from not distinguishable to easily distinguishable.

distinguish

The final stage of the reading process when an authorised user recognises what is being displayed on the basis of its appearance.

diverging junction

One or more facing points within a signal section where a train can be routed towards alternative lines.

diverging route

Any signalled line beyond a diverging junction that is not designated as the principal route. This includes routes on which only a shunt MA applies.

Domain Name Service (DNS)

No definition.

DOTe contingency plan

A plan produced by a railway undertaking which sets out the action to be taken when on-train equipment becomes defective on any train or vehicle operated by that railway undertaking, and which meets the requirements of this document.

double rail track circuit

A track circuit where both rails are electrically separated from the adjacent track circuit, either using insulated rail joints or a tuned zone

download and upload

For public communications, the download direction follows normal convention and is from 'the internet' to their terminal, and the upload direction is to 'the internet'. For railway applications, the reverse has become established: the 'download' direction is 'train-to-shore', while the 'upload' direction is 'shore-to-train'.

drive/train driving

The human tasks and processes necessary to control the movement of a train in accordance with operating rules and procedures.

driveability

The ease and reliability that train drivers are able to perform train operations in accordance with rules and procedures, throughout the range of operational and ambient conditions applicable to each train, within the operational context and while performing typical required duties.

driveable

A capability requirement of the lineside signalling system to provide train drivers with the information needed to support their conformity with the train driving rules and procedures.

Driver Advisory System (DAS)

Provides information for a train driver to optimise the train's speed over a given route, with the capability for more efficient energy usage, improved punctuality and increased network capacity.

Driver Machine Interface (DMI)

Provides indications to the driver of the system status, as well as allowing the driver to control selected system functions.

Driver Only Operation (Passenger) DOO(P)

A method of working which permits trains to operate without the need of a guard on passenger trains.

Driver Only Operation (DOO)

A method of working which permits trains to operate without the need of a guard.

driver safety device (DSD)

A device to detect driver incapacity.

driver's key [GSM-R]

The means to identify that a particular cab is the one being controlled by the driver.

drivers crossing indicator (DCI)

No definition.

driving position

The normal position from which the driver controls the train, by operating the primary controls, as set out in GMRT2161. The active driving position is the position being used by the driver to drive the train.

driving van trailer (DVT)

No definition.

duplex

The radio can receive and transmit simultaneously.

dynamic host configuration protocol (DHCP)

No definition.

E**E-UTRA**

Evolved UMTS or UMTS Long Term Evolution (3GPP LTE).

effective isotropic radiated power (EIRP)

No definition.

EGNOS Data Access System/Service (EDAS)

No definition.

EIRENE functional requirement specification (EIRENE FRS)

Defines a set of high-level functional requirements for the GSM-R radio system. This specification facilitates international interoperability between national railways by ensuring that core railway functionality is provided.

EIRENE system requirement specification (EIRENE SRS)

Defines the set of technical requirements and constraints in order to ensure international operability between national railways. It includes the architecture of the target on-board and trackside systems with references to the detailed specifications defining standardised interfaces.

electric multiple unit (EMU)

A type of train that may be DC, AC or dual voltage.

electric token block section

A section of single line extending, in each direction of travel, between the last stop signal (that is to say, the section signal) controlled from one signal box to the first stop signal (that is to say, the home signal) controlled by the next signal box. The electric token is the prime authority to enter the block section.

electrical and power (E&P)

No definition.

electrical control operator (ECO)

No definition.

electrical interconnector

Jumper or auto-connector designed to carry electrical conductors between vehicles, irrespective of whether or not they interact with the vehicle through which they pass. These include cables that leave one vehicle for use in electrical circuits on another vehicle and any plugs or sockets required to complete the interconnector system.

electromagnetic compatibility (EMC)

The ability of equipment or a system to function satisfactorily in its electromagnetic environment without introducing intolerable electromagnetic disturbances to anything in that environment.

electromagnetic field (EMF)

No definition.

electromagnetic interference (EMI)

No definition.

electronic point-of-sale (EPOS)

No definition.

Electronic Product Code Information Services (EPCIS)

No definition.

Electronic Product Code (EPC)

No definition.

electronic token

A token that is issued to and returned from a Cab Display Unit (CDU) or Transportable Token Unit (TTU) in the form of securely encoded data transmitted over a radio system, and which has no physical representation.

elementary files (EF)

Within a SIM card file system elementary files contain various types of data, structured as either a sequence of data bytes, a sequence of fixed-size records or a fixed set of fixed-sized records used cyclically.

Emergency Brake Deceleration (EBD)

The location (or deceleration curve) calculated by the ERTMS/ETCS onboard, if the train is to be slowed down by use of emergency brakes, using current or estimated speed, and other train parameters.

Emergency Brake Intervention (EBI)

The location which the emergency brakes have to apply if the train is not to exceed the EBD position (or deceleration curve).

Emergency Brake (EB)

No definition.

emergency counter

A counter that enables a unique number (within a total set of designated numbers) to be assigned to each use of the emergency key.

emergency key (EM)

A key on the integrated touchscreen, operated by the signaller, that enables signalling functions of the RETB system to be carried out in the event of a failure of radio data communication between the signalling centre and a CDU. The key can also be used to remove radio numbers from the system. Use of the emergency key is subject to special instructions. The key enables the interlocking to be overridden when unusual operating circumstances require tokens to be withdrawn outside the normal sequence.

emergency speed restriction (ESR)

A temporary speed restriction which is not shown in the Weekly Operating Notice (WON), or which is more restrictive than shown, or which applies at a time other than that shown in the WON.

encapsulating security payload (ESP)

No definition.

End of Authority (EoA)

A location to which the train is permitted to proceed and where target speed = zero.

end termination unit (ETU)

A termination unit used in TI 21 / EBI track circuit.

Energy Subsystem (ENE)

No definition.

Engineering Safety Management (ESM)

The activities involved in making sure that the risk associated with changes to the railway is reduced to an acceptable level. This is set out in a document known in the railway industry as the *Yellow Book*. The document contains a comprehensive glossary of safety terms.

engineering token

An electronic token issued to personnel, trains, road rail vehicles or road vehicles, to permit them to work on the section of line to which the engineering token applies.

enhanced data rates for global evolution (EDGE)

An enhanced radio modulation method for GSM and TDMA (IS – 136) networks to achieve significantly higher data rates. Combines circuit mode and data.

enhanced long range navigation (eLoran)

An independent, dissimilar, complement to Global Navigation Satellite Systems (GNSS). It allows GNSS users to retain the safety, security, and economic benefits of GNSS, even when satellite services are disrupted.

enhanced multi-level precedence and pre-emption (eMLPP)

It defines the user's priority.

enhanced permissible speed (EPS)

The speed permitted over a section of line that applies to a specific type of train operating at cant deficiencies in excess of those permitted at the permissible speed. There may be more than one enhanced permissible speed applicable to a given section of line.

enhanced presentation functional number (ePFN)

Where presenting only the functional number of a subscriber may not provide sufficient information for the other party/parties in the call, the ePFN is a tag that allows for the presentation of three further pieces of information, namely 'ASCII text information', country information', 'call type'.

entity in charge of maintenance of a vehicle (ECM)

An ECM is registered as an ECM for a vehicle in the national vehicle register, and can include people or organisations such as railway undertakings, infrastructure managers, keepers or maintenance organisations. Source: *ROGS*

ephemeris

The information which describes the satellite position and clock information. A GNSS position solution in effect treats the satellites as known points in space and determines the receiver position by measuring distances to these known points. Each GNSS satellite broadcasts its own ephemeris, sometimes referred to as navigation data.

error

Discrepancy between a computed, observed or measured value or condition, and the true, specified or theoretically correct value or condition. Source: *IEV 192-03-02*

Note: An error within a system may be caused by failure of one or more of its components, or by the activation of a systematic fault. Source: *IEV 192-03-02*

ERTMS entity

Either an Onboard Unit (OBU), Radio Block Centre (RBC), National Area, Balise group, Key Management Centre, Euroloop, GSM-R radio network, or Radio Infill Unit (RIU).

ERTMS Key

A long number used in a coding algorithm to achieve secure communications.

ERTMS national identity

Either an Onboard Unit (OBU), Radio Block Centre (RBC), National Area, Balise group, Key Management Centre, Euroloop, GSM-R radio network, or Radio Infill Unit (RIU).

ERTMS/ETCS DMI

The full interface between the driver and the ERTMS/ETCS onboard equipment containing all inputs and outputs (for example, visual, audible, keys, and buttons).

ERTMS/ETCS

ETCS part of ERTMS.

estimated front end

The position the ERTMS/ETCS onboard equipment estimates the front of the train to be at, with the highest probability according to the physical characteristics of the train and to the odometer working conditions. It is expressed as a distance from a location reference detected by the ERTMS/ETCS onboard equipment.

ETCS Data only Radio (EDOR)

No definition.

ETCS onboard subsystem diagnostic tools

Tools that support the following processes for the ETCS onboard subsystem: maintenance, fault-finding, data download, data analysis and data interrogation.

ethernet switch

An Ethernet IEEE 802.3 device permitting the physical connection of multiple Ethernet cables and performing Ethernet data switching.

ethernet train backbone (ETB)

A bus connecting the vehicles of a train and which conforms to the train communication network protocols, as defined by *BS EN 61375-2-5:2015*.

Euronorm (EN)

Europe-wide standards that help in developing the single European market for goods and services in all sectors. The intention of ENs is to facilitate trade between countries, create new markets, and cut compliance costs.

European Geostationary Navigation Overlay Service (EGNOS)

It is the European Satellite Based Augmentation Service (SBAS) which complements the US Global Positioning System (GPS) by providing corrections and integrity information over Europe.

European Integrated Railways Radio Enhanced Network (EIRENE)

The functional and system requirements specifications that define the GSM-R system at a European level.

European Rail Traffic Management System (ERTMS)

Signalling and operation management system encompassing ETCS for control command, and GSM-R for voice and data. It is a system for providing real-time control and supervision of trains, consisting of trainborne, track and lineside equipment. The objective is to enable the operation on compatible signalling systems across European borders.

European Railway Agency (ERA)

No definition.

European Telecommunications Standards Institute (ETSI)

Produce globally-applicable standards for Information and Communications Technologies (ICT) including fixed, mobile, radio, converged, broadcast and Internet technologies.

European Train Control System (ETCS)

The signalling, control and train protection part of the European Rail Traffic Management System designed to provide interoperability and standardisation across European railways.

European Union Agency for Railways (ERA)

An agency of the European Union charged with the facilitation of a safe, modern integrated European railway network so that railways become more competitive and offer high-quality, end-to-end services without being restricted by national borders via interoperability.

European Union (EU)

No definition.

European Vehicle Number (EVN)

A unique 12-digit vehicle identification number in a common European format as specified by the *OPE NTSN Appendix H*.

European Vital Computer (EVC)

The computer which is part of the ERTMS/ETCS onboard equipment.

excessive speed

With reference to provision of TPWS on the approach to speed restrictions, a speed exceeding the overspeed margin above which derailment risk is considered to require mitigation.

explicit call transfer (ECT)

This service allows a user who has two calls to connect these two calls together and release its connections to both other parties.

Exposure Limit Value (ELV)

No definition.

external data

Data that is exchanged between C-DAS RU subsystem and IM data systems.

F

Fixed Telecoms Network (FTN)

No definition.

Freight Operating Company (FOC)

No definition.

facing point lock (FPL)

Equipment fitted to facing points to secure the points in the correct position for the passage of trains.

facing points (FP)

Points where train movements can be routed towards different lines, irrespective of whether or not they constitute part of a diverging junction.

failure classification

The method of ranking system failures relative to the level of uncontrolled safety risk introduced into the operational railway by the failure.

failure identifier

A unique identification code allocated by infrastructure managers and railway undertakings to each reported failure in accordance with their safety management systems.

failure symptom

The way in which a control, command and signalling (CCS) system fails to operate or operates incorrectly.

Far North Line (FNL)

No definition.

Fast Fourier Transform (FFT)

An algorithm used in signal processing to convert a signal from time domain to frequency domain.

fault [electrical]

A situation where an abnormal electric current is generated. For example, a short circuit due to dewirement is a fault in which current bypasses the normal load. In practice, the protection systems have a sufficiently fast response time to clear the fault in <1 s and so the risk of EMF exposure is considered tolerable as the time at risk is very small. This may be further refined in the future following the publication of additional guidance from the HSE and EU.

fault [software]

An incorrect software system state that prevents it from performing as required. It may result from failures in system components, design errors, environmental interference, or operator errors.

femtocell

A small, low-power cellular base station providing localised mobile (cellular) coverage typically connected via Internet Protocol (IP) to the mobile network operator(s) infrastructure.

fenced green zone

Common term for the Safe System of work using a safety barrier (fenced) as defined in GERT8000 Handbook 7.

financial point-of-sale (FPOS)

No definition.

firewall

A network security system that monitors and controls incoming and outgoing network traffic based on predetermined security rules.

first cautionary aspect

A type of cautionary aspect that provides the first opportunity for a train driver to obtain information about the limit of MA ahead of the train. First cautionary aspects include: 4-aspect first caution; 3-aspect caution; outermost distant ON aspect; 4-aspect outer junction approach flashing caution; 3-aspect junction approach flashing caution; splitting distant caution.

fixed terminal (FT)

A GSM-R terminal used in a signal box or control office linked to the Fixed Telecoms Network and able to make/receive calls/messages to/from cab radios, other FTs and land lines.

foreign domain

An ERTMS Key Management Domain outside the scope of the national GB ERTMS Key Management Domain.

fouling point (FP)

The position on a converging, diverging or crossing line beyond which the encroachment of any part of a vehicle would infringe the required passing clearance for a vehicle on the other line.

free indication

A lamp or electrical indicator provided to show whether a lever is free to be operated by the ground frame operator.

free space loss (FSL)

No definition.

freight train

Trains signalled as classes 3 to 8 and 0. By this definition, light engines and trains comprising empty coaching stock or parcels trains, are permitted to use facilities provided for freight trains.

frequency division duplex (FDD)

No definition.

frequency

Number of cycles per second. Frequency can be used to describe how often an oscillator oscillates.

Full Supervision mode (FS)

ERTMS/ETCS on-board equipment mode giving full protection against overspeed and overrun.

fully automatic selective door operation (FASDO)

A type of door selection system.

function code (FC)

Identifies the actual user of a mobile.

functional number (FN)

Functional numbering or functional addressing describes the process of placing a call using a number that refers to the function which a user is performing at a certain time, as opposed to simply identifying the terminal equipment used.

functional requirements specification (FRS)

A specification required by users based on system functions.

G

Galileo

The Global Navigation Satellite System (GNSS) of the European Union (EU) and the European Space Agency (ESA).

gauge

Set of rules, including a reference contour and its associated calculation rules allowing defining the outer dimensions of the vehicle and the space to be cleared by the infrastructure. Source: *ENE NTSN*.

Note: According to the calculation method implemented, the gauge will be a static, kinematic or dynamic.

GB mainline railway

'Mainline railway' has the meaning given to it in the Railways and Other Guided Transport Systems (Safety) Regulations 2006 (as amended) and the associated exclusions. 'GB mainline railway' is the mainline railway network excluding any railway in Northern Ireland, the Channel Tunnel, the dedicated high-speed railway between London St Pancras International Station and the Channel Tunnel, and any other exclusions determined by the Secretary of State.

GBS

One of the position data sentences defined by NMEA. It is used to support RAIM by providing information on faults per satellite.

General Packet Radio Service (GPRS)

An evolution of GSM for packet data transmission – operates in the GSM frequency bands.

GGA

One of the position data sentences defined by NMEA. It contains latitude, longitude, height and quality indicators.

gigabyte (GB) [computing]

Equivalent to 1,000,000,000 bytes.

gigahertz (GHz)

Equivalent to 1,000,000,000 Hertz.

GLL

One of the position data sentences defined by NMEA. It includes latitude, longitude and a Mode Indicator which indicates the type of solution used when computing a position.

Global Individual Asset Identifier (GIAI)

No definition.

Global Navigation Satellite System (GNSS)

The technology of navigation by satellite applicable to all such systems, for example, GLONASS, GPS, and Galileo.

Global Positioning System (GPS)

A type of Global Navigation Satellite System (GNSS), originally deployed by the USA for military use but now available for civil use. It consists of 24 satellites that orbit the earth and provides location and time information, anywhere on or near the earth where there is an unobstructed line of sight to four or more GPS satellites.

Global System for Mobile Communications – Railway (GSM-R)

The European Standard specific to railway applications for the transmission by radio of voice and data between train and trackside installations. Source: *GERC8517 Issue 1*

Global System for Mobile Communications (GSM)

A cellular digital mobile radio system.

Globalnaya Navigazionnaya Sputnikovaya Sistema (GLONASS)

A type of Global Navigation Satellite System operated by Russia consists of a constellation of 24 satellites. Its signals are similar to, but have differences from, the GPS signals.

GNSS Range Residuals (GRS)

One of the position data sentences defined by NMEA. It supports RAIM by providing range residuals (the difference between calculated range and measured range) for satellites used in the positioning solution.

Great Britain (GB) [geographical]

No definition.

grid array

An area grid pattern on the total image display area consisting of cells, which results in a visual appearance of information in certain proportions.

ground frame operator

A person employed by a railway undertaking, who is authorised to operate a ground frame.

ground frame release device

A device provided to lock and unlock a ground frame and retain the release device (for example, a token) until the ground frame is restored to normal.

ground frame release key

A key, either directly released from a release instrument or attached to a token or train staff, which is used to release a ground frame.

ground frame release

The method by which the ground frame is unlocked to allow its use either by an electrical release or a mechanical key.

ground frame

A control point comprising levers or switches to permit the local operation of points and, where provided, the associated signals. It can be in the form of a ground switch panel.

GS1

Organisation managing the allocation of company codes for RFID systems. <https://www.gs1uk.org/>

GSA

One of the position data sentences defined by NMEA. It includes GNSS DOP information and IDs of all satellites used in computing the position solution.

GSM-R network

The whole ground system, which the GSM-R train voice radio communicates with including the fixed user terminals.

GSM-R train voice radio

GSM-R cab mobile or a GSM-R operational radio configured using a GSM-R train voice radio SIM card as a train voice radio.

GSM-R transportable cab radio

A self-contained unit consisting of a GSM-R radio complete with a textual MMI, handset and loudspeaker in a robust case.

GST

One of the position data sentences defined by NMEA. It provides pseudorange noise statistics.

GSV

One of the position data sentences defined by NMEA. It includes IDs of all satellites that are theoretically in view from a user receiver.

H

hazard identification (HAZID)

The process of finding, listing and characterising hazards. Source: *CSM RA*

hazard precursor

A system failure, sub-system failure, component failure, human error or operational condition which could, individually or in combination with other precursors, result in the occurrence of a hazardous event.

hazard record

The document in which identified hazards, their related measures, their origin and the reference to the actors that are required to manage them are recorded and referenced. Source: *CSM RA*

hazard

A condition that could lead to an accident. Source: *CSM RA*

head and torso simulator (HATS)

No definition.

headcode

A four-digit alphanumeric string used in GB for identifying a train in the context of a journey. It is of the form nAnn, for example, 1A56.

Health and Safety Executive (HSE)

No definition.

High Integrity Systems Group (HISG)

A group facilitated by RSSB for the rail industry.

high speed downlink packet access (HSDPA)

Modulation method based on WCDMA evolution, standardised as part of the 3GPP Release 5, that improves the peak data rate and throughput (dependent on radio conditions) to enhance spectral efficiency.

high speed packet access (HSPA)

The combination of HSDPA and HSUPA.

high speed uplink packet access (HSUPA)

Complementary to HSDPA, offering similar enhancements in uplink performance between terminal device and base station.

high voltage impulse (HVI)

A type of track circuit.

high voltage protection unit (HPU)

No definition.

high voltage (HV)

The set of voltage levels in excess of low voltage. Source: *IEV 601-01-27*

highly improbable

An occurrence of failure at a frequency less than or equal to 10^{-9} per operating hour. Source: *CSM RA*

home signal

A stop signal that denotes the exit end of a block or token section, or a limit of a signal section within station limits.

Hot Strip

Popular name for close viewing sector, in a colour light signal.

Huddersfield control

A CCS system feature that prevents a train from receiving an MA until the train using a permissive MA within the same signal section has completed its movement.

Human Machine Interface (HMI)

The graphical interface device which indicates information to the operator (user) and which is used by the operator for the purpose of operating the associated system(s).

hybridisation

The method of integrating GNSS with other complementary sensors and systems. The diverse source of data is processed within the locator unit to improve one or more of service coverage, integrity and accuracy. The sources of hybridisation data could include Inertial Measurement Units (IMUs), location database or map, speed sensors and terrestrial positioning signals.

Hyper Text Transfer Protocol (HTTP)

No definition.

I

identifiable

The extent to which a signal, indicator or sign is capable of being identified, ranging from not identifiable to easily identifiable.

identification plate

A conspicuous identity sign that can easily be read by users. The plate can be a lineside sign, or part of a lineside sign.

identification (ID)

The act of identifying.

identify/identifying [lineside signs, lineside signals and indicators]

The stage of the reading process when an authorised user is able to confirm that a lineside signal, indicator or sign is relevant to the task being performed.

illuminance

The luminous flux density at a surface in a defined plane. The SI unit of illuminance is the lux, which is equal to one lumen per square metre (lm/m^2).

IMT-2000

TU term for third generation mobile family.

incident

An unplanned, uncontrolled or unintended event which under different circumstances could have resulted in an accident.

independent shunting signal

A shunting signal that is capable of presenting a stop aspect; includes a signal denoting a limit of shunt.

indication of route

A lineside signalling system display that conveys information about the route set at a diverging junction in the form of either:

- a) A signal aspect and route indication combination
- b) A combination of semaphore signal aspects
- c) A flashing or splitting distant signal aspect
- d) A preliminary junction indication
- e) A splitting banner repeater indication.

indication

A function of a protection system or a warning system that displays system status.

indicator

A lineside signalling asset that is capable of displaying a signalling indication.

inertial measurement unit (IMU)

No definition.

infrastructure geography [data]

The data which describes the topography and topology of the network infrastructure. It comprises three parts:

- a) Track Geography – Track centre line, altitude, curvature
- b) Rail Network Model(s) – Connectivity and Navigability
- c) Track features – Asset data (points, stations, tunnels, location markers, for example mileposts, line identities etc) and other parameters (for example ETCS supported levels and speed display units).

It also includes linkages (mapping) between (b) and (a), and between Timing Point locations and Track Geography/Track features, and a means–based on track link id – to support mapping between routing data, track geography and network models.

infrastructure location

A set of lineside signalling infrastructure features defined by the infrastructure manager. Examples include: a junction area; station area; signal box control area.

infrastructure manager [network]

The person who:

- a) In relation to infrastructure, other than a station, is responsible for developing and maintaining that infrastructure
- b) Manages and uses that infrastructure, or permits it to be used, for the operation of a vehicle

infrastructure manager [stations]

The person who:

- a) In relation to a station is responsible for managing and operating that station
- b) Manages and uses that station, or permits it to be used, for the operation of a vehicle.

infrastructure manager (IM)

Has the meaning given to it in the Railways and Other Guided Transport Systems (Safety) Regulations 2006 (as amended), but is limited to those infrastructure managers who hold a safety authorisation issued in respect of the mainline railway. Source: *ROGS*

infrastructure

All the network subsystems: infrastructure including all the network subsystems: infrastructure, energy and trackside CCS, as defined in *RIR*.

Ingress Protection (IP)

Ingress Protection as set out in *BS IEC 60529*.

input field

An object shown to the driver to echo entered data. It is composed of a label part giving the topic of the data and of a data part showing the data itself.

Input/Output (I/O)

No definition.

Institute of Electrical and Electronics Engineers (IEEE)

No definition.

insulated rail

The rail of a single rail track circuit that is fitted with insulated rail joints to electrically separate the sections. Also known as the signal rail.

integrity [software]

The fidelity of the code to the intended specifications, that is, functions implemented in the software would behave as intended in the requirements.

integrity

The ability to provide users with warnings within a specified time and at specified probability (risk) when the output from the sub-system should not be used, as its accuracy falls outside a predefined threshold.

inter-modulation product (IMP)

No definition.

interleaving

An arrangement where the arming or trigger transmitter of one pair of TPWS track transmitters is positioned between a different pair of TPWS track transmitters.

Interlocked absolute block section

A section of single line extending, in each direction of travel, between the last stop signal (that is to say, the section signal) controlled from one signal box to the first stop signal (that is to say, the home signal) controlled by the next signal box. The section signal OFF aspect is the authority to enter the block section.

interlocking

A general term applied to the setting and releasing of Signals and Points to prevent unsafe conditions arising; also the equipment which performs this function.

intermediate block home signal

A stop signal that controls the exit from an intermediate block section.

intermediate block section

The line between the section signal and the intermediate block home signal controlled from one signal box in the same direction of travel. The section signal OFF aspect is the authority to enter the intermediate block section.

intermediate token instrument

A mid section token instrument, usually located at a ground frame and associated with shutting-in facilities.

intermodulation products

These are the unwanted additional signals generated at different frequencies from two or more radio signals mixing in a non-linear way.

internal data

Data that is exchanged between C-DAS IM Subsystem and C-DAS RU Subsystem.

international data encryption algorithm (IDEA)

No definition.

International Organization for Standardization (ISO)

No definition.

International Telecommunication Union (ITU)

No definition.

Internet Engineering Task Force (IETF)

No definition.

Internet Key Exchange (IKE)

No definition.

Internet Protocol (IP)

No definition.

internet service provider (ISP)

No definition.

interoperability constituent (IC)

An elementary component, group of components, subassembly or complete assembly of equipment incorporated or intended to be incorporated into a subsystem. Interoperability constituents are placed on the market with an intended area of use and are assessed for conformity independently of the subsystem.

interoperability

A European initiative enabling the railway to compete more effectively with other forms of transport, particularly road transport. It can contribute to reducing costs and provide safe and uninterrupted movement of trains across Europe. It does this through establishing common checking and authorisation processes.

interpret/interpreting [signalling system displays]

The action of understanding the information conveyed by the lineside sign, signal aspect or indication after it has been read. (For example, understanding that a red signal aspect means 'limit of MA'.)

interpretability

The ease and reliability with which signs, signal aspects and indications can be interpreted by an authorised user throughout the range of operational and ambient conditions applicable to that feature, within the operational context and while performing typical required duties. This ranges from never interpretable to always interpretable.

interpretable [signalling system displays]

The extent to which the information conveyed by a lineside sign, signal aspect or indication can be reliably interpreted, ranging from not interpretable to easily interpretable.

intervention

The function that calls for the application of the train's brakes in response either to a warning or protection function, which may be an overspeed condition or to the detection of the train tilting within a section of track where tilt is not authorised.

IP multimedia subsystem (IMS)

Standardised architecture enabling converged voice and data services in the mobile environment, built on Internet services, applications and protocols.

IP Security Protocol suite (IPsec)

No definition.

IP-X

An RFID air-interface protocol.

ITU-T

Telecommunication Standardization Sector of the International Telecommunications Union.

J

journey registration using alphanumeric input

A registration specific for GB using alphanumeric head code and location code.

journey

The route from the starting point of a train (siding, platform or other place) to its planned destination (siding, platform line or other place), or where:

- it is required to reverse before continuing to its destination
- vehicles are attached or detached
- it is terminated short of its destination.

Any light locomotive movement, empty coaching stock movement or short distance shunting movement is a separate journey from the associated train movement.

junction indicator (JI)

An indicator provided at a junction signal to inform the driver which way a junction is set, by means of a line of white lights.

junction inner approach signal

On 4-aspect signalled lines, the main signal immediately before the junction signal in the direction of travel.

junction signal

A signal protecting facing points over which more than one main route is available.

junction/junction area

A geographical location within the railway infrastructure that incorporates one or more diverging junctions or converging junctions.

juridical recording unit (JRU)

A device to record actions and exchanges relating to the operation of trains, sufficient for off line analysis of events. Usually for the purposes of legal and law administration.

K

Kaba key

A key used to activate a cab display unit used on RETB worked lines.

Key Distribution Centre

The offline ERTMS key management system entity that processes the generated ERTMS keys to match the ERTMS entities' proprietary formats.

Key Management Centre (KMC)

The central system managing ERTMS keys within the key management domain.

Key Management Domain (KDC)

The set of KMAC entities managed by the KMC.

Key Management System (KMS)

Collective term for the personnel, equipment and procedures used to manage ERTMS keys in the ERTMS key management domain.

key message authentication code (KMAC)

No definition.

key release device

A device that includes a mechanism to lock and unlock a defined number of keys available to the user, which is controlled via an interface with the controlling interlocking.

key

A form of guaranteed permission provided by the infrastructure manager to the railway undertaking to use the defined protection, issued by the signaller to the user via the signalling lockout system in the form of a removable, portable key (token or similar physical authority).

kilonewton (kN)

Equivalent to 1000 N.

kilovolt (kV)

Equivalent to 1000 V.

KMAC entity

The KMAC entities are KMAC onboard or KMAC trackside entities.

KMAC onboard entity

The KMAC onboard entity is the European Vital Computer (EVC).

L

L_NVKRINT

An ETCS variable that is used for setting the train length step used to define the integrated correction factor K_r .

label

The presentation of information in graphical form or text indication on a button or associated with an input field.

Layered Interface Exchange (LINX)

The data integration platform being developed as part of the Network Rail Traffic Management system.

leading vehicle

A vehicle permitted to operate at the head of a train. Unpowered vehicles which are used at the head of a train only when following the rules for propelling movements are excluded.

legacy national system

CCS systems and functions, which include requirements for Class B train protection systems, lineside signalling systems, train detection systems, train radio systems and other CCS systems associated with train operations.

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.

level crossing

An intersection at the same elevation of a road, footpath or bridleway and one or more rail tracks.

Source: *IEV 821-07-01*, modified

levers

A method of working a signalling system mechanically by using human effort.

light source

A device serving as a source of illumination within a display element (for example, a light emitting diode or a filament lamp).

Lime Street Control

A CCS system feature that uses train detection system information to estimate train length and the available space in an occupied station platform, to determine whether a signal can be cleared to a proceed aspect.

Limit of Authority (LoA)

The place beyond which the train has no information but to which the train is authorised to run with a defined target speed higher than zero. The train is expected to receive new information before passing the Limit of Authority.

limit of shunt

A stop aspect that is applicable to shunting movements in the opposite direction to the predominant flow of traffic on a running line.

Limited Supervision mode (LS)

ERTMS/ETCS on-board equipment mode giving partial protection against over speed and over run. The driver has to observe and obey to line side signals and operating rules when in limited supervision mode.

line current

The current drawn by a train from the traction supply and returned from the train into the rails. Where current is returned to the rails at more than one point, this is the vector sum of current from all return points within the train.

line replaceable unit (LRU)

A modular component of a structural system or subsystem that is designed to be replaced quickly.

line speed

Maximum speed measured in kilometres per hour for which a line has been designed. Source: *ENE TSI*.

lineside operational sign

A sign, positioned at the lineside, that conveys information needed to support the management of the operation of trains.

lineside safety sign

A sign that conveys information about health and safety to railway personnel or the public, and is located on, or in close proximity to, the railway.

lineside signalling asset

Any of the following:

- a) a lineside signal, indicator or lineside operational sign (excluding signs associated with a temporary speed restriction)
- b) point machines, ground frames and RBC
- c) a mirror or monitor that forms part of a train dispatch system
- d) switches, plungers, signs and indicators that form part of a train dispatch system and which are used by platform staff.

lineside signalling hardware

Hardware that is approved or authorised for lineside signalling system applications.

lineside signalling system

A type of signalling system that presents information about movement authorities, routing, equipment status, operational information and changes in permissible speeds using lineside displays. The system is configured using the following asset types:

- a) signals
- b) route indicators
- c) system status indicators
- d) train dispatch system indicators
- e) some types of lineside operational sign.

lineside status indicator (LSI)

No definition.

lineside telephone

A telephone mounted near the railway line but not at a signal and therefore not a signal post telephone (SPT). Such lineside telephones may be provided for the use of staff operating ground frames or lockout devices, or for the use of staff carrying out maintenance.

liquid crystal display (LCD)

No definition.

lit

The state of a signalling product when it is generating visible light.

local area network (LAN)

A network that connects computers and other devices in a relatively small area, typically a single building, group of buildings or other self-contained environment, such as a train.

local internet registry (LIR)

No definition.

Locally monitored system/infrastructure

A signalling system or train protection system that uses a lineside signalling indication to indicate its operational status to users.

location code

Because train running numbers are not unique nationally, and the GSM-R network is a national communications system, it is necessary for the network to be able to differentiate between trains during the registration process, so as to prevent registration failures due to duplicate TRNs. This is

achieved by entering information relating to the location from which you are attempting to register, thus making the registration code an almost unique seven digit number.

location identifier device (LID)

No definition.

locations database

A database of information relevant to a given location (set of coordinates). The information meets the requirements of a specified application. It could, for example, be a station name and permissible stopping points along the platforms.

locator

An on-train system that provides train location, speed and timing information to support a range of on-train and back-office applications.

lockout available control

The function of the interlocking, which transmits a control to the key release device to unlock a key.

London Underground (LU)

No definition.

long range kinematic (LRK)

No definition.

long section electronic token

Depending on its application:

a) a unidirectional token, applicable from a stop board at one token exchange point to:

- (i) a stop board, or
- (ii) a designated siding.

At the next token exchange point ahead, or

b) a section token that covers two or more successive token sections.

Long-Term Evolution (LTE)

A fourth generation wireless broadband technology developed by the Third Generation Partnership Project (3GPP). LTE represents the next step (4G) in the progression of GSM standards. LTE provides increased peak data rates, reduced latency, scalable bandwidth capacity, and backwards compatibility with existing GSM technology.

low voltage (LV)

A set of voltage levels used for the distribution of electricity and whose upper limit is generally accepted to be 1000 V for AC and 1500 V for DC. Source: *IEV 601-01-26*, modified

lower quadrant position

A display comprising either a semaphore signal arm or an arrangement of lit display elements that is aligned so that the left-hand end of the display is positioned below the right-hand end of the same display, when viewed from the front.

lowered (or ineffective) state [of trainstop]

The status of a trainstop such that it will not initiate a brake application on a train passing the trainstop.

LTE positioning protocol (LPP)

No definition.

luminance uniformity ratio

The ratio of the minimum to the average luminance over a specified surface.

luminance

The luminous flux density at a surface in a defined plane. The SI unit of luminance is the lux, which is equal to one lumen per square metre (lm.m^{-2}).

luminous flux

The quantity of light emitted by a source, or received by a surface. The SI unit of luminous flux is the lumen (lm).

luminous intensity

A photometric measure of light travelling in a given direction. It describes the amount of light that passes through or is emitted from a particular area, and falls within a given solid angle. The SI unit for luminous intensity is candela (cd). One candela is equivalent to one lumen per steradian.

M

M_NVAVADH

An ETCS variable that is used for setting the weighting factor for available wheel/rail adhesion used by the ETCS braking model.

M_NVCONTACT

An ETCS variable that is used for setting the ERTMS/ETCS onboard reaction when T_NVCONTACT expires.

M_NVDERUN

An ETCS variable that is used for setting the entry of ETCS Driver ID permitted while running.

M_NVEBCL

An ETCS variable that is used for setting the confidence level ETCS braking model for emergency brake safe deceleration on dry rails.

M_NVKRINT

An ETCS variable that is used for setting the ETCS braking model's integrated correction factor Kr.

M_NVKTINT

An ETCS variable that is used for setting the ETCS braking model's integrated correction factor Kt.

main aspect approach release from red (MAR)

Main junction signal approach controlled from a main stop aspect.

main aspect approach released from yellow (4 Aspect) (MAY-YY)

Main junction signal approach controlled from a 4-aspect single yellow caution (Y), preceded by a 4-aspect first caution.

main aspect approach released from yellow (Flashing 3 Aspect) (MAY-FA3)

Main junction signal approach controlled from a 3-aspect caution, preceded by a 3-aspect junction approach flashing caution.

main aspect approach released from yellow (Flashing 4 Aspect) (MAY-FA4)

Main junction signal approach controlled from a 4-aspect single yellow caution (Y), preceded by a flashing 4-aspect aspect sequence.

main aspect free-splitting distance (MAF-SD)

Unrestricted main junction signal aspect, preceded by a splitting distant proceed aspect(s).

main aspect free (MAF)

Unrestricted (free) junction signal aspect sequence.

main junction signal

A main stop signal that protects a diverging junction and is capable of presenting an indication of route associated with a non-permissive MA.

main radio unit

The equipment, which utilises the antenna and drives the DMI, handset and loudspeaker.

main stop signal

A signal that is capable of presenting a main stop aspect.

mainline railway

Mainline railway has the meaning given to it in the Railways and Other Guided Transport Systems (Safety) Regulations 2006 (as amended) and the associated exclusions. It excludes metros and other light rail systems; networks that are functionally separate from the Mainline; heritage, museum or tourist railways; and privately owned infrastructure as defined in the regulations.

maintenance, repair and overhaul (MRO)

No definition.

map-matching

A means of checking if an estimate of location determined by GNSS is reasonable by comparing the estimate with a database of known positions of the track.

material change

Any change to an asset or the use of an asset that has the potential to affect physical or operational interfaces.

maximum speed [of a rail vehicle]

The maximum speed at which a rail vehicle is designed to run, as determined by the characteristics of the rail vehicle.

maximum train speed (v_{\max})

The assessed highest approach speed of any train at any time. This may be the permissible speed, the attainable speed or the assessed speed.

mean time between failures (MTBF)

No definition.

megabyte (MB)

No definition.

megahertz (MHz)

One hertz simply means 'one cycle per second' and the associated multiple values, for ease of use, are MHz (megahertz, 10^6 Hz).

menu accessed directory

A telephone directory stored in the GSM-R train voice radio, accessed by the menu, primarily consisting of the signallers' numbers, subject to national configuration control processes by the network operator.

microtesla (μ T)

A measurement unit for magnetic field strength equivalent to 0.001 Tesla.

milliseconds (ms)

Equivalent to 0.001 seconds.

millitesla (mT)

A measurement unit for magnetic field strength.

miniature circuit breaker (MCB)

No definition.

minimum deceleration distance (MDD)

A signalling system parameter that supports technical compatibility with the specified braking performance of trains when decelerating to a lower target speed after the full service brake is commanded, taking account of:

- a) The highest train speed when the brake is commanded
- b) The infrastructure gradient after the brake is commanded
- c) The required speed reduction.

minimum readable distance (MRD)

The readable distance value for an asset that is calculated to provide the minimum response time (MRT), taking account of the maximum train speed.

minimum response time (MRT)

The assessed minimum time needed by a driver (or other authorised user) to respond to the information presented by a specific lineside signalling asset, taking account of the following human tasks: a) Read the display or display combination. a) Interpret the display or display combination. b) Assimilate all of the available information. c) Decide what action to take (if any), and when it needs to be taken. d) Take the action, where necessary, before the train passes the asset. $MRT = BRT + SRT$.

minimum signalling braking distance (MSBD)

A signalling system parameter that supports technical compatibility with the specified braking performance of trains when decelerating to a stop after the full service brake is commanded, taking account of:

- a) The highest train speed when the brake is commanded
- b) The infrastructure gradient after the brake is commanded
- c) The required stopping position.

MOBIKE

Mobility and multi-homing protocol defined by RFC 4555.

mobile communications gateway (MCG)

The equipment providing the connection between the vehicle wireless access points and/or femtocells and the train-to-Internet connection.

Mobile Country Code (MCC)

Part of the International Mobile Subscriber Identity (IMSI) number, which uniquely identifies a particular subscriber.

Mobile Network Code (MNC)

In combination with MCC, identifies uniquely a network operator.

mobile network operator (MNO)

A provider of wireless communications services and owns or controls all the elements necessary to sell and deliver services. An MNO will be responsible for the radio spectrum allocation, wireless network infrastructure, back haul infrastructure, billing, customer care, provisioning computer systems, and maintenance and repair organisations. May also be known as a wireless service provider, wireless carrier, or mobile network carrier.

mode related speed

The ceiling speed value defined for use during operation by the national value for the following ERTMS/ETCS modes: SR, OS, RV, UN and SH. The ceiling speed values are defined by national

values, which can be overridden by the ERTMS/ETCS trackside subsystem or, for SR mode, by the train driver.

most restrictive display/signal aspect/indication

The display that conveys the most restrictive information at that asset.

motor converter module (MCM)

No definition.

movement authority (MA)

The authority given by a signaller (or ground frame operator), issued via the signalling system to the train driver, which is the authority to move the train within defined limits.

MPT 1327

A common signalling protocol for land Private Mobile Radio (PMR) operators in the frequency band 174-225 MHz.

multi-processor module (MPM)

No definition.

multi-SPAD signal

A signal where more than one category A SPAD incident has occurred in the previous five years.

Note: Further definitions relevant to SPAD categories are set out in *GORT3119*.

multipath

The propagation phenomenon that results in radio signals reaching the receiving antenna by two or more paths. In certain application scenarios such as GPS, the prolonged distance travelled by radio signals can lead to range errors which will then propagate through into position errors.

multiple unit

A fixed formation of one or more vehicles capable of operation under their own traction power; the formation may be capable of working in multiple with other similar formations.

multiple-input and multiple-output (MIMO)

A method for multiplying the capacity of a radio link using multiple transmit and receive antennas to exploit multipath propagation. MIMO is an essential element of wireless communication standards, including IEEE 802.11n (Wi-Fi), IEEE 802.11ac (Wi-Fi), High Speed Packet Access (HSPA) + 3G, WiMAX (4G), and Long Term Evolution (4G).

mutual screening conductor (MSC)

No definition.

N

nanotesla (nT)

A measurement unit for magnetic field strength.

national accreditation body

As defined in Article 2 of Regulation (EC) No 765/2008. *Source: CSM RA*

national area

A geographic area which is characterised by the same value of ETCS parameter NID_C. A National Area does not necessarily follow administrative or geographic boundaries.

National Marine Electronics Association (NMEA)

No definition.

National System mode (SN)

ERTMS/ETCS on-board equipment mode in which the supervision of the train is ensured by a National System.

National Technical Rule (NTR)

A technical rule used for implementing the essential requirements in the circumstances listed in *RIR*.

National Train Control (NTC)

No definition.

negligible risk failure

A failure which does not result in the protection provided by the signalling system being reduced. Also known as a 'right side failure'.

nesting

An arrangement where one pair of TPWS track transmitters is positioned in between a different pair of TPWS track transmitters.

network address translation (NAT)

No definition.

network identifier (NetID)

No definition.

Network Management Centre (NMC)

One or more locations from which network monitoring and control is exercised over a computer or telecommunication network.

network model

A description of the track layout which specifies how it may be traversed, that is, permissible sequences of track links.

Network Rail (NR)

No definition.

network time protocol (NTP)

No definition.

new CCS system

A CCS system that either:

- a) implements a new technology within the railway system, or
- b) applies an existing technology to a new operational railway context.

new design of lineside operational sign

A sign required for a purpose within the scope of this document, but which is not currently included within the catalogue of lineside signs.

NID_BG

This ETCS parameter is the identity of a balise group; it uniquely identifies the balise group within the area defined by NID_C.

NID_C

This ETCS parameter is the identity number of a National Area.

NID_ENGINE

This ETCS parameter uniquely defines the identity of the on-board ETCS equipment, stored in the European Vital Computer (EVC).

NID_KMC

This ETCS parameter identifies the Key Management Centre within a National Area.

NID_LOOP

This ETCS parameter uniquely defines the identity number of a Euroloop within a National Area.

NID_MN

This ETCS parameter defines the identity of the GSM-R network that the mobile has to register with.

NID_RADIO

This ETCS parameter defines uniquely the radio subscriber number of the RBC.

NID_RBC

This ETCS parameter uniquely identifies an RBC within a National Area.

NID_RIU

This ETCS parameter uniquely defines the identity number of a radio in-fill unit within a National Area.

NID_STM

This ETCS parameter uniquely defines the identity number of an existing national system or group of national systems.

NID_XUSER

This ETCS parameter uniquely defines the identity of the User Design Authority, as set out in Subset-026. GE/RT8064 defines this as RSSB in Great Britain.

No power mode (NP)

ERTMS/ETCS on-board equipment mode in which the on-board equipment is not powered and the emergency brake is commanded.

no signaller token block section

A section of single line directly controlled from one signal box and extending in each direction of travel from the section signal or equivalent lineside operational sign at one end to the home signal or equivalent lineside operational sign at the other end of the section. The electric token is the prime authority to enter the block section.

no signaller token block – remote section

A section of single line which is supervised but not directly controlled from a signal box and extending in each direction of travel from the stop board, lineside operational sign or buffer stop at one end to the stop board, lineside operational sign or stop block at the other end of the section. The electric token is the prime authority to enter the block section.

no signaller token instrument

A token instrument located at the remote end of a no signaller token block section and used by authorised railway personnel to facilitate token exchange.

non-block signal

A mid-section stop signal specifically provided for the protection of a level crossing or other hazard, and without block or section signal controls.

Non-Leading mode (NL)

ERTMS/ETCS on-board equipment mode when it is connected to an active cab which is not in the leading engine of the train.

non-permissive MA

Authority for a train to proceed into a signal section that is not occupied by other rail vehicles.

non-permissive train movement

A train movement into a section of line that is clear of other rail vehicles as far as the limit of MA.

normal position

The position of a lever when it is back in the lever frame (away from the operator), also the position of a switch when it is turned to the left.

normal

All the equipment is functioning as intended without reconfiguration of the system architecture in order to maintain system availability. For example, under normal conditions, one of the transformers at the feeder station powers the line in the up direction to the next mid-point track section cabin (TSC). The other transformer similarly feeds the line in the down direction.

Notified Body (NoBo)

The bodies responsible for assessing the conformity or suitability for use of the interoperability constituents or for appraising the EC procedure for verification of the subsystems. Source: *Article 2 (j) of Directive 2008/57/EC*

Notified National Technical Rules (NNTR)

No definition.

NSTR

No signaller token with remote crossing loops; or no signaller token remote.

O**obscuration [lineside signalling asset]**

A condition where 10 % or more of a single light source, group of light sources, semaphore signal arm/disc or sign that make up all or part of a signal aspect, indication or lineside operational sign is not visible for all or part of the required reading time. A partial obscuration is where between 70 % and 90 % is visible. Anything less than 70 % visible is considered to be a complete obscuration.

obscuration time

The time period associated with each obscuration experienced by the driver when the train is moving.

occupied (OCC)

A portion of a line between two successive signals which are capable of displaying a stop aspect, or between such a signal and the end of the line, on which a train, or a part of a train, is already positioned.

Ofcom (Office of Communications)

No definition.

Office of Communication Office of Rail Regulation (Ofcom ORR)

No definition.

Office of Rail and Road (ORR)

The independent safety and economic regulator for Britain's railways.

on or near the line

Within 3 m of the nearest rail of any line, and on the line itself. On a platform the term 'on or near the line' applies only to the part of the platform within 1.25 m of the platform edge and only when an engineering or technical activity is taking place. Source: *RIS-3279-TOM*

On Sight mode (OS)

ERTMS/ETCS on-board equipment mode that gives the train driver partial responsibility for the safe control of their train. In this mode the train possesses a movement authority but the track ahead might be occupied by another train.

on-track machine (OTM)

Any rail-mounted machine, whose primary function is for the renewal, maintenance, inspection or measurement of the infrastructure, meeting the requirements of GMRT2400 and permitted by the Rule Book to be moved, either self-propelled or in train formation, outside a possession.

on-train monitoring recorder (OTMR)

No definition.

on-train networks

A network that supports communications between two end-points on the same train set, where a train set is comprised of one or more carriages and power units that are normally coupled together. Both wired and wireless networks can support on-train communications.

one-train staff instrument

An active instrument that can detect the presence of the one-train staff and control its extraction. The one-train staff receptacle is a passive instrument. It is also another term for 'one-train staff controller'.

one-train staff or token

A physical object which may be issued to the driver to provide the authority to enter a single line.

one-train working

A method of signalling on a single line, with or without a one-train staff, where only one train at a time is permitted on an out-and-back basis.

OPE TSI (Operation and Traffic Management Technical Specification for Interoperability)

No definition.

open mobile alliance (OMA)

No definition.

open shortest path first (OSPF)

No definition.

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.

operating task

A task directly associated with the operation of a train (for example, train driving, train dispatch, shunting).

operational availability (A_0)

The probability that at an arbitrary point in time, the system is operable, that is to say, is 'up'. It is a function of the frequency of the maintenance, active maintenance time, waiting time, logistics time, administrative time, and the ready time of the system, and is expressed as:

$$A_0 = \text{UPTIME} / \text{TOTALTIME}$$

where:

UPTIME = total time in a system is in an operable state

TOTALTIME = the combination of uptime and downtime

in which downtime is the time in which a system spends in an inoperable state.

operational communication domain (OCD)

Comprises all networks and systems that support railway operational communications. These include selective door operation (SDO), passenger load determination (PLD), passenger information services (PIS), vehicle tracking, train and engine performance monitoring, etc. During future deployments, the scope of this domain can be extended to include train control applications.

operational context

The operational features of the external environment that influence compatibility, including train operations, station operations and infrastructure operations.

operational handportable radio (OPH)

A hand-held robust portable GSM-R radio with the capability to make and receive railway emergency calls that, as a minimum, meets all the mandatory requirements for an 'operational radio' as specified within the Control Command and Signalling TSI, including NNTRs. Referred to as OPH for radios without shunting mode and OPS for those with.

operational information

Operational information conveyed by the lineside signalling system describing an action to be taken by a user.

operational signs

Signs used to convey movement authority or other information to drivers, in order that they can control their train correctly.

opposing locking

Locking applied to a signal route by a route set in an opposing direction.

opposing signals

Signals which protect the same piece of railway from opposite directions.

organisational identifier (Org ID)

No definition.

original equipment manufacturer (OEM)

No definition.

orthogonal frequency division multiplexing (OFDM)

No definition.

OS acknowledgement window

The opportunity given to the train driver to acknowledge a transition to OS.

overhead line equipment (OHLE)

No definition.

Overhead Line Equipment (OLE)

No definition.

overlap (OL)

The distance beyond a stop signal that must be clear, and where necessary locked, before the stop signal preceding the stop signal in question can display a proceed aspect.

overlay

A section of the route that is fitted with both ETCS and conventional signalling and which supports the ETCS operation of rail vehicles, and the conventional operation of rail vehicles which have the ETCS fitted or do not have ETCS-qualified drivers.

overrun

The movement of a train or vehicle beyond the designed end limit of a track.

overspeed (sensor) system (OSS)

A TPWS facility whose function is to initiate a brake application on a train that approaches a signal showing a danger aspect, or other location, at excessive speed.

P

Packet 44

The means to transmit data for national applications between train and track and vice versa, using the data transmission facilities included within the ETCS. It is available for use by all Railway Group members. Such data messages are identified by being contained in data packets which include the packet identifier (NID_PACKET) 44. Applications which use data transmitted using Packet 44 are not subject to the requirements of interoperability legislation.

Packet Header (PH)

No definition.

packet

Data with a particular functional objective that is defined by the packet identity.

panel processor module (PPM)

No definition.

party, other party

Where the party concerned is the infrastructure manager, the other party is the railway undertaking and where the party concerned is the railway undertaking, the other party is the infrastructure manager.

passenger information system (or services) (PIS)

A system that provides information to passengers.

passenger line

A line on which passenger train movements may take place.

passenger load determination (PLD)

No definition.

passing clearance

The minimum calculated distance between the swept envelopes of two specific types of rail vehicle as they pass on adjacent tracks at nominated speeds, taking account of appropriate track tolerances and accuracy of measurement.

Passive Shunting mode (PS)

ERTMS/ETCS on-board equipment mode that allows the on-board of a slave engine to be part of a shunting consist; or to carry on a shunting movement with a single engine fitted with one on-board equipment and two cabs, when the driver has to change the driving cab.

path identifier

An identifier which identifies a particular service uniquely across the GB rail network on a particular day. This identifier is expected to be a concatenation of the fields Train ID, Train UID and 'HH' hour of the time at origin from the Common Interface File [RD7] Basic Schedule (BS) record. As an example: Train ID = 1Q04 and a Train UID = U39506 and a time at origin of 14:30 generates a value of '1Q04U3950614'.

perception

The recognition of, or making sense of, visual information. Perception is a 'top-down', or 'conceptually-driven' process determined by cognitive function and influenced by knowledge and expectation.

Peripheral Component Interconnect Express (PCIe)

A high-speed serial computer expansion bus standard.

Peripheral Component Interconnect (PCI)

No definition.

permanent way (P Way)

No definition.

permissible speed indicator (PSI)

A lineside signalling asset that displays the permissible speed(s) over a section of line.

permissible speed warning indicator (PSWI)

A lineside signalling asset that displays the advance warning of a reduction in permissible speed.

permissible speed

The authorised maximum speed over a section of line, either for all trains or (where differential or enhanced permissible speeds are applied) for specific types of trains, as set out in the Sectional Appendix.

permissive freight (PF)

An operation that involves more than one train occupying the same section of line that is not within a platform.

Permissive MA

Authority for a train to proceed into a signal section that is occupied by a rail vehicle.

Permissive Passenger (PP)

An operation that involves more than one passenger train occupying the same section of line within a station platform.

permissive train movement

A train movement into a signal section that is occupied by other rail vehicles.

permissive working

A method of signalling a train movement into a section of line that is occupied by another train or rail vehicle(s).

personal computer memory card international association (PCMCIA)

No definition.

personal computer-visual display unit (PC-VDU)

No definition.

personal digital assistant (PDA)

No definition.

personal navigation device (PND)

No definition.

physical button

A button, which achieves its function by mechanical means.

platform sharing

Permissive working which permits two or more passenger trains to simultaneously occupy the same signalling section within a station platform, other than for the purposes of attaching, detaching or removing vehicles, without the existence of a mid-platform signal or limit of MA.

point set indicator (PSI)

No definition.

point-to-point (PTP)

A call between two radio terminals.

Police and Criminal Evidence Act 1984 (PACE)

An act of law to regulate police powers and protect public rights.

Position, speed and time [of a train] (PVT)

No definition

Post Trip mode (PT)

ERTMS/ETCS on-board equipment mode that is entered after a train trip when the train has been brought to a stand and the driver has acknowledged the situation.

preceding shunt signal

An independent shunting signal located between two main stop signals so that the signal aspect is facing the direction of travel associated with a non-permissive MA.

preliminary routing indicator(PRI)

An indicator associated with a junction, giving the driver prior information about which route is set at the junction.

preset signal

A signal that can be cleared by the route set from another signal, for a train movement to pass the signal in the direction to which it applies. When a signal is preset, it is neither at the beginning nor the end of the MA.

press-to-talk (PTT)

No definition.

primary control

A control essential for the safe driving of a train or rail vehicle, operable by the train driver from the normal driving position.

principal route

The signalled line beyond a diverging junction that has the highest permissible speed of all routes at the junction.

printer control module (PCM)

No definition.

private mobile radio (PMR)

No definition.

proceed aspect

Any signal aspect that is used to authorise a train movement.

proceed on sight authority (POSA)

A signal aspect for use during lineside signalling failures to instruct the driver to enter a signal section and proceed at such a speed that the train can be stopped short of any obstruction.

procuring

A process of identifying, planning, and benchmarking goods and services that are purchased. The procurement process includes defining the outcomes that are being sought, and determining whether there is agreement between buyers and suppliers on an optimum service design.

projectile risk

The risk from a metallic object being moved as a result of a magnetic field that causes injury to a person.

protection system

Any system that allows a user to prevent or restrict the signalling of rail traffic in some way to provide for the protection of persons on or near the line.

public communication domain (PCD)

It comprises all networks and systems that support public communications. This includes on-train access to public internet services and fixed systems providing passenger information services to the general public.

public key infrastructure (PKI)

No definition.

public switched telephone network (PSTN)

'Conventional' telephone system based on circuit switched connections carrying voice-oriented information.

pulse per second (PPS)

No definition.

pushing data

The process of automatically uploading data from one computer server to another.

Q

Q_MAMODE

An ETCS variable relevant to the configuration of an OS mode profile.

Q_NVDRIVER_ADHES

An ETCS variable that is used for setting the qualifier for the modification of ETCS trackside adhesion factor by the driver.

Q_NVEMRRLS

An ETCS variable that is used for setting the qualifier for ETCS emergency brake release.

Q_NVGUIPERM

An ETCS variable that is used to define whether the use guidance curve is permitted in the braking model.

Q_NVINHSMICPERM

An ETCS variable that is used for setting the permission to inhibit ETCS compensation of the speed measurement inaccuracy.

Q_NVKINT

An ETCS variable that is used for setting the qualifier for the ETCS braking model integrated correction factors.

Q_NVKVINTSET

An ETCS variable that is used to describe the type of Kv_int set which it is intending to set.

Q_NVLOCACC

An ETCS variable that is used for setting the default location accuracy of a balise location.

Q_NVSBFBPERM

An ETCS variable that is used to define whether the use of service brake feedback is permitted in the ETCS braking model.

Q_NVSBTSMPERM

An ETCS variable that is used to define whether the use of service brake is permitted in target speed monitoring.

Q_NVSRBKTRG

An ETCS variable that is used for setting the permission to use service brake when braking to a target is supervised.

Quality of Service (QoS)

A measurement of transmission rates, error rates, priority, dedicated bandwidth and other parameters relating to performance of data networks.

quadrature amplitude modulation (QAM)

No definition.

quadrature phased shift keying (QPSK)

No definition.

R**R2**

The national central database of rail vehicle design and operational data, owned and maintained on behalf of the industry by RSSB. It incorporates the previous Rolling Stock Library (RSL) and RAVERS systems. It integrates with key industry systems, including TOPS, Gemini, GENIUS, and the National Vehicle Register (NVR).

Radio & Telecommunications Terminal Equipment (R&TTE)

The Radio Equipment and Telecommunications Terminal Equipment Regulations, SI 2000 No. 730.

radio access network (RAN)

A 'wire-free' segment of a communications network based on radio technology that connects other devices via a standardised air interface to the main network.

Radio Block Centre (RBC)

A centralised computer unit working with an interlocking(s) to establish and control safe train separation. Receives location information via radio from trains and sends movement authorities via radio to trains.

radio electronic token block (RETB) section

A designated section of running line between and including token exchange points, operated under the radio electronic token block (RETB) system of signalling.

radio electronic token block (RETB)

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.

Radio Frequency Identification (RFID)

A method of storing and retrieving data via electromagnetic transmission to a radio-frequency-compatible integrated circuit.

Radio Frequency (RF)

No definition.

radio infill unit (RIU)

A trackside component that transmits infill information by radio to trains.

radio interface module (RIM)

No definition.

radio number

The unique number of the CDU or TTU.

Radio Technical Commission for Aeronautics (RTCA)

No definition.

Radio Technical Commission for Maritime Services (RTCM)

No definition.

Rail Accident Investigation Branch (RAIB)

No definition.

Rail Delivery Group (RDG)

No definition.

Rail Safety and Standards Board (RSSB)

No definition.

Railcat

A data cable designed to deliver high-speed broadband, wifi and GSM on rail services. It can be obtained from Huber and Suhner.

railway equipment

Any equipment within the railway system operated by an infrastructure manager or railway undertaking.

railway staff (user)

A person employed by an infrastructure manager or railway undertaking, acting in accordance with their duties.

railway system

The structure composed of lines and fixed installations of the existing rail system in the United Kingdom plus the vehicles of all categories and origin travelling on that infrastructure. Source: *RIR*

railway undertaking (RU)

Has the meaning given to the term 'transport undertaking' in the Railways and Other Guided Transport Systems (Safety) Regulations 2006 as amended, but is limited to any private or public undertaking the principal business of which is to provide rail transport services for goods and/or passengers, with a requirement that the undertaking must ensure traction. Source: *ROGS*

raised (or effective) state [of trainstop]

The status of a trainstop such that it will initiate a brake application on a train passing the trainstop.

read [signalling system displays]

The process of detecting, identifying and distinguishing the relevant lineside signalling display or display combination. Reading is a precondition to a driver interpreting the information conveyed by the lineside signalling system.

readability [lineside signalling]

The ease and reliability with which signal aspects, indications and signs can be read by an authorised user throughout the range of operational and ambient conditions applicable to that hardware, within the operational context and while performing typical required duties. This ranges from never readable to always readable.

readable distance

The attribute of a lineside signalling asset that describes the distance range within which an authorised user can read the presented display(s).

readable [lineside signalling system]

A qualitative statement indicating that an authorised user can read the signal. A signal or a sign is considered readable if a person just meeting the eyesight requirements for their role, is able to consistently and reliably identify displayed aspects, indications and sign, when observing the hardware under the conditions in which an authorised user will view it, in clear weather conditions, by day and by night.

reading-through

A driver reading a signal aspect that does not apply to the train being operated.

real time kinematic (RTK)

No definition.

received signal strength indication (RSSI)

No definition.

receiver autonomous integrity monitoring(RAIM)

No definition.

receiver

Any device which is capable of receiving radio signals sent by a radio transmitter.

receive (Rx)

No definition.

receiving loudness rating (RLR)

A loudness rating as defined in ITU-T P.79 Series P: Telephone Transmission Quality, Telephone Installations, Local Line Networks.

receptacle or key release instrument

The place where the ground frame release key is secured when not in use.

recognition

An attestation by a national body other than the national accreditation body that the assessment body meets the requirements set out in Annex II to Commission Implementing Regulation (EU) 402/2012 to carry out the independent assessment activity specified in Article 6(1) and (2). Source: *CSM RA*

record

Register in writing a finding from examination, test, inspection or special checks in accordance with procedures. Sources: *RIS-2702-RST*, edited; *GMGN2497*, edited

reduced overlap

An overlap that is shorter than the minimum permitted length of a full overlap, where the permitted approach speed is below a specified level which still allows an unrestricted approach to a signal at danger.

reference system

A system proven in use to have an acceptable safety level and against which the acceptability of the risks from a system under assessment can be evaluated by comparison. Source: *CSM RA*

release lever

A lever that is subject to control from the supervising signalling centre and which, when operated, prevents the signalling centre from withdrawing the release. Where a switch is used instead of a lever, the releasing and backlocking function is carried out by relays.

reliability

The ability of an item to perform a required function under given environmental conditions for a given period of time. Source: *BS EN 50128:2011*

Remote Condition Monitoring (RCM)

No definition.

Report on EMF Modelling

The accompanying report is detailed in Appendix A available on www.sparkrail.org.

reported safety related failures of CCS systems

Failures of control, command and signalling (CCS) systems that have been reported in accordance with GERT8000, the Rule Book, including reported failure allegations and failures found during in-service maintenance and testing.

Representational State Transfer (REST)

No definition.

request for comments (RFC)

No definition.

required readable distance (RRD)

The readable distance that is maintained for each lineside signalling asset.

Note: This may be equal or greater than the minimum readable distance (MRD) for that asset.

required stopping position

The infrastructure location at which the train driver is required to stop the train. This can be at a specified infrastructure location or a position relative to something else, for example the end of a train or rail vehicle.

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.

restore

The replacement of the ground frame to its normal state.

restricted overlap (ROL)

An overlap that is shorter than the minimum permitted length of a full overlap, which is available only when the preceding signal is subject to approach control by selection of a warning class route.

RETB key

Is specially engraved and inserted into the CDU to power the unit and enable the exchange of tokens. The RETB key has historically within the RETB systems been referred to as a Kaba key.

return conductor

Conductor paralleling the track return system and connected to the running rails at periodic intervals. Source: *EN 50122-1:2011+A1:2011*

return loss [of an antenna]

The ratio of the power reflected back from the antenna to the power transmitted into the antenna. It is usually expressed in dB.

Return Screening Conductor (RSC)

No definition.

reverse position

reverse position

The position of a lever when it is pulled towards the operator and also the position of a switch when it is turned to the right.

Reversing mode (RV)

ERTMS/ETCS on-board equipment mode that allows the driver to change the direction of movement of the train whilst controlling the train from the same cab.

right away indicator (RA)

An indicator that displays 'RA' to inform the driver that a train may start from a platform.

right hand (RH)

No definition.

right-hand circularly polarised (RHCP)

No definition.

risk acceptance criteria

The terms of reference by which the acceptability of a specific risk is assessed; these criteria are used to determine that the level of a risk is sufficiently low that it is not necessary to take any immediate action to reduce it further. Source: *CSM RA*

risk acceptance principle

The rules used in order to arrive at the conclusion whether or not the risk related to one or more specific hazards is acceptable. Source: *CSM RA*

risk assessment

The overall process comprising a risk analysis and a risk evaluation. Source: *CSM RA*

risk estimation

The process used to produce a measure of the level of risks being analysed, consisting of the following steps: estimation of frequency, consequence analysis and their integration. Source: *CSM RA*

risk evaluation

A procedure based on the risk analysis to determine whether an acceptable level risk has been achieved. Source: *CSM RA*

risk management

The systematic application of management policies, procedures and practices to the tasks of analysing, evaluating and controlling risks. Source: *CSM RA*

risk

The combination of the likelihood of occurrence of harm and the severity of that harm (specifically defined in CSM RA regulation as: the frequency of occurrence of accidents and incidents resulting in harm (caused by a hazard) and the degree of severity of that harm).

RMC

One of the position data sentences defined by NMEA. It contains latitude, longitude, speed, bearing, time and fix status.

road rail vehicle (RRV)

No definition.

road vehicle (RV)

No definition.

roll in roll out

The time it takes for train to decelerate from line speed to a stopping station, dwell, then accelerate to line speed again, where a higher rate of deceleration and acceleration will gain higher performance.

Rolling Stock Owning Company (ROSCO)

No definition.

route indication

A display of specified appearance that is used to conveying routing information to a user.

route indicator

A lineside signalling asset that is capable of presenting a route indication.

route section

A section of a route over which a regular long-distance commuter is assumed to travel (in one direction) for the purposes of calculating the risk to the commuter from overturning of the train in which they are travelling. The route section extends between stations or junctions at which the commuter joins and leaves the route. Route sections for long-distance commuters are in the order of 100 miles long.

route

The physical path of a journey to be undertaken by a vehicle or a collection of vehicles, where the path is comprised of a number of track sections, each of which has individually defined characteristics.

routing information

Information conveyed by the lineside signalling system describing the route or destination that is associated with an MA.

running line

A line that runs between two distinct locations, as shown in Table A of the appropriate Sectional Appendix.

Réseaux IP Européens (RIPE)

Provides internet resource allocations.

S**safe emergency deceleration rate**

The value applied to generate the EBD curve. The value is derived from applying derating factors and route's gradient to the emergency deceleration rate, which is an extract from the train's braking model or a derivative from the conversion model.

safe integration

The action to ensure the incorporation of an element (for example, a new vehicle type, network project, subsystem, part, component, constituent, software, procedure, organisation) into a bigger system, does not create an unacceptable risk for the resulting system.

safety acceptance

Status given to the change by the proposer based on the Safety Assessment Report provided by the assessment body. Source: *CSM RA*

safety assessment report

The document containing the conclusions of the assessment performed by an assessment body on the system under assessment. Source: *CSM RA*

safety critical

Directly influencing safety (when applied to equipment or systems).

Safety Integrity Level (SIL)

A number which indicates the required degree of confidence that a system will meet its specified safety function. *Source: BS EN 50129:2003*

safety integrity

The ability of a system to achieve its required safety function under all the stated conditions within a stated operational environment and within a stated period of time. *Source: BS EN 50129:2003*

Safety Management System (SMS)

The organisation and arrangements established by a transport operator to ensure the safe management of its operation. *Source: ROGS*

safety measures

A set of actions either reducing the frequency of occurrence of a hazard or mitigating its consequences in order to achieve and/or maintain an acceptable level of risk. *Source: CSM RA*

safety related failure

A failure of a control, command and signalling (CCS) system or item of equipment, which may result in increased risk, for example due to the absence, or deterioration, of control measures necessary to prevent an accident.

safety requirements

The safety characteristics (qualitative or quantitative, or when needed both qualitative and quantitative) necessary for the design, operation (including operational rules) and maintenance of a system in order to meet legal or company safety targets. *Source: CSM RA*

Safety Risk Model (SRM)

A quantitative representation of the potential accidents resulting from the operation and maintenance of the GB rail network. It is comprised of a number of individual models, each representing a type of hazardous event, where a hazardous event is defined as an event that has the potential to result in injuries or fatalities.

safety

The freedom from unacceptable risk to the outside from the functional and physical units considered. *Source: IEV 351-57-05*

satellite [or space] based augmentation service (SBAS)

No definition.

satellite communications (SATCOM)

No definition.

satellite navigation and associated technologies (SNAT)

No definition.

schedule updates

Any changes made to the planned schedule for a particular service, so as to regulate trains and/or to recover from perturbations. The data may include any or all of: changes to schedule times, running lines, route (corridor), stopping pattern, minimum dwell times, and schedule timing tolerances.

screened twisted pair cable (ScTP)

No definition.

section signal

A stop signal controlling the entrance to a block section or intermediate block section.

section token

An electronic token giving authority, subject to supplementary requirements for voice communications, for the train to enter and occupy a token section.

secure digital (SD)

No definition.

secure user plane location (SUPL)

No definition.

security association (SA)

No definition.

selective door operation (SDO)

A type of door selection system.

serious accident

An accident involving a derailment or collision of rolling stock which has an obvious impact on railway safety regulation or management of safety and includes such an accident that results in:

- a) the death of at least one person
- b) serious injuries to five or more persons, or
- c) extensive damage to rolling stock, the infrastructure or the environment.

Source: *Railway (Accident Investigation and Reporting) Regulations 2005*

service brake deceleration (SBD)

The location (or deceleration curve) calculated by the ERTMS/ETCS onboard, if the train is to be slowed down by use of service brakes, using current or estimated speed, and other train parameters.

service brake intervention (SBI)

ETCS Service Brake Intervention. The location which the service brakes have to apply if the train is not to exceed the SBD position (or deceleration curve).

service coverage

The proportion of the railway network for which a train's position can be reported at the required level of accuracy and confidence. It is the characterisation of a lack of service coverage that determines whether an application can operate with GNSS alone, or whether augmentation or hybridisation is required. It is in the nature of the railway and GNSS processing that geographic limitations to service coverage are present, and the acceptable loss of service depends upon the needs of the application.

service set identifier (SSID)

A Wi-Fi naming convention that acts as a unique identifier of one or more Wireless Access Points.

set speed

The minimum speed at which a brake application is initiated when a train passes over the track elements of an active OSS.

setup data

Driver ID, Train Running Number (TRN), Train Specific Data.

setup

The driver-controlled sequence by which the on-train DAS subsystem is prepared for operation. This may be either Full Setup which is generally performed when the driver first activates the cab, or Partial Setup which must be performed whenever any of the Setup Data is changed.

Sharing Portal for Rail Knowledge (SPARK)

No definition.

shunt token

An electronic token issued to trains, road vehicles or trackside maintenance personnel giving authority for shunt movements or possession of the line between the station limit boards at the same token exchange point (TEP).

shunter's release

A push button or switch that is controlled by a shunter which, when operated, allows points or a route to be operated by the supervising signalling centre.

shunting MA

Authority for a train to proceed for shunting operations.

Shunting mode (SH)

ERTMS/ETCS on-board equipment operating mode which allows the train to move in shunting, without available train data.

shunting signal

A stop signal that is capable of presenting a shunt aspect.

shutting-in facilities

A facility which permits a train to be shunted clear of a main line into a siding and then the ground frame normalised to permit normal train movements.

signal aspect/indication

A display of specified appearance that is used to convey a specific set of information to a user.

signal box

The building in which the signaller(s) is situated, together with the signalling control and indication system. This includes any manned block post. An alternative term for 'signalling centre'.

signal centre (SC)

No definition.

signal head/indicator

A type of signal hardware that houses the signal light source housing.

signal in space over the internet (SISNeT)

No definition.

signal light source

The feature used to generate the signal light.

signal light

A light of a particular colour specification, which is defined in BS 1376:1974.

signal overrun assessment tool (SORAT)

A software developed and validated by Network Rail.

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)

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 post telephone (SPT)

A telephone provided at a signal, enabling the driver to communicate with the signaller, to report a fault or incident or to remind the signaller of the presence of a train detained at the signal that is displaying a danger aspect.

signal regulation

The controls applied to delay a proceed signal aspect until the level crossing warning sequence has been activated for a predetermined time.

signal section

A portion of line between two consecutive stop signals that apply to train movements in the same direction.

signal sighting assessment

The process of assessing the compatibility of lineside signalling assets with train operations.

Signal Sighting Committee (SSC)

A team of assessors that provides the minimum competence and information about the lineside signalling system operational context necessary to reach an informed assessment decision on what needs to be done to achieve compatibility of a lineside signalling asset with train operations.

signal sighting form

The formal record of a lineside signalling asset, including its design configuration and readability performance.

signal sighting

The activity of locating a signal for the purposes of optimum approach view by the driver.

signalled movement

A movement authority given by, and under the control of, the supervising signalling centre or by the ground frame on supervised lines or sidings.

signaller

A person responsible for the operation of the signalling system, to safely control the passage and regulation of trains, usually located in a signal box. Replaced the obsolete term, signalman.

signalling and operational telecommunications systems and equipment

Systems and equipment used for authorising and safeguarding the movement of trains, and communications systems and equipment provided for safety purposes in the direct operation of the railway.

signalling braking distance (SBD)

The distance between the first signal exhibiting a cautionary aspect and the signal at which the train is required to stop.

signalling lockout system

A type of protection system that is interlocked with the signalling system to ensure that movement authorities cannot be issued into the defined protection area when the protection is being used.

Signalling Maintenance Testing Handbook (SMTH)

No definition.

signalling product

A product that conforms to the requirements set out in GKRT0057 or GIRT7033.

signal

A lineside signalling asset that presents information concerning movement authorities.

significant change

A proposed change with an impact on safety, implying the requirement to apply CSM RA, based on the following criteria:

- a) failure consequence
- b) novelty used in implementing the change
- c) complexity of the change
- d) monitoring
- e) reversibility
- f) additionality.

Source: *CSM RA*

sign

Any surface (usually in one plane) that presents a fixed image or text, in order to convey specific information to the viewer.

simple asset

A lineside signalling asset made up of one element that generates only one display at a time, all of which have similar readability performance (for example, a 4-aspect colour light signal).

Simple Object Access Protocol (SOAP)

No definition.

simultaneous operation

The transmission and reception of voice speech or data occurring in two or more radio systems at the same time. Note: paging would not be considered as simultaneous operation.

single line instrument

An instrument which can contain one or more tokens or a one-train staff and controls their release.

single line

A generally bi-directional line which is the only line that carries running movements.

single rail track circuit

A track circuit where only one rail is electrically separated from the adjacent track circuit using an insulated rail joint. The other rail is electrically continuous for traction return purposes.

single rail (SR)

A track circuit arrangement where only one rail (the insulated rail) has IRJs to separate the track circuits. The other rail (the common rail) is electrically continuous for traction return purposes.

single track mile (STM)

No definition.

site configuration information (SCI)

No definition.

Sleeping mode (SL)

ERTMS/ETCS on-board equipment mode that is used for the on-board equipment in slave engines controlled by a leading engine.

slots/slotting

In the context of ground frames, the control of a signalling function which requires co-operation between the signal box and a ground frame.

small office/home office (SoHo)

No definition.

so far as is reasonably practicable (SFAIRP)

Used in the Health and Safety at Work etc. Act 1974 which places duties on employers in the UK to ensure safety 'so far as is reasonably practicable' (SFAIRP). It is similar to the term ALARP which refers to the principle of reducing risk to 'as low as reasonably practicable'. Although SFAIRP and ALARP are different in law, they are used interchangeably in the GB rail industry and are regarded as representing the same health and safety legal test.

soft key

A type of VDU display using context-dependent physical keys for input adjacent to an associated label within the display area.

software safety integrity level (software SIL)

A classification number which determines the techniques and measures that have to be applied to software. Source: *BS EN 50128:2011*

software-defined networking (SDN)

An approach to computer networking that allows network administrators to programmatically initialise, control, change, and manage network behaviour dynamically via open interfaces and abstraction of lower-level functionality.

spate indicator

A trackside indicator or sign, which informs the driver that a temporary speed restriction has been withdrawn earlier than published or has not been applied.

spatial uniformity

Light is distributed spatially in terms of brightness and contrast across a surface in a constant uniform manner.

special vehicle

A rail vehicle that is used for other than normal revenue earning purposes (for example infrastructure inspection, maintenance, de-icing and rail vehicle recovery including associated barrier, generator and storage vehicles) also known as departmental vehicles.

specific case

A special provision in relation to the technical specifications for a subsystem or an interoperability constituent to allow for its compatibility with the rail system, which is set out in an NTSN or an NTR and described in that NTSN or that NTR as a 'UK specific case'.

Specific Transmission Module (STM)

Device allowing the ERTMS/ETCS onboard equipment to be interfaced with the onboard part of an existing National Train Control system. It allows smooth transitions from/to the National System and gives access to some ERTMS/ETCS on-board resources (e.g. DMI). Source: *ERTMS_and_ETCS Glossary of Terms UNISIG Subset-023 v3.1.0 dated 12/05/2014*

specular reflectance

Reflection in a sharply defined direction equal to the angle of incidence from a smooth interface between homogeneous materials, that is to say, obeying the law of reflection.

speed supervision

The function of measuring the speed of a train and comparing the value obtained against a limit. If the limit is exceeded the function prompts other functions, for example informing the driver, calling for the brakes.

spurious emissions

Unintentional radio signals radiated by a radio transmitter. Some of this energy could be in the receive band of one of the other systems that are present on the train.

Staff Responsible mode (SR)

ETCS Staff Responsible mode.

stagger

The longitudinal distance between two insulated rail joints that constitute a pair, measured along the track.

Stand By mode (SB)

ERTMS/ETCS on-board equipment mode that is a default mode when the on-board equipment is powered up or that is entered when shunting or non-leading mode is left or when the active cab is closed.

STANOX

Station Number Code.

static speed profile

This is the speed profile at which the train may operate over a particular stretch of infrastructure, and reflects infrastructure constraints, direction and the ETCS train categories. Static Speed Profiles are the ETCS equivalent of Permissible Speeds.

station limit boards

The station limit boards give authority for shunt movements or possession of the line at the same TEP.

station limits

The term 'station limits' is used to describe a section of line between two adjacent block sections that is under the control of one signal box or token control point. Station limits extends on each signalled line from the first home signal to the section signal.

stop aspect

A signal aspect that denotes a limit of MA.

stop signal

A signal that is capable of presenting a stop aspect.

strike-in point (SIP)

The position on the approach to an automatic level crossing or other installation at which a train initiates the warning or closure sequence.

subscriber identity module (SIM) [

A small card inserted into the cab radio that provides core identification for the operation of that cab radio in making and receiving calls. The SIM card is part of the GSM-R network and remains the property of the GSM-R network provider.

subsystem

Part of a system, which is itself a system. Source: *BS EN 50129:2018* and *IEC 60050-192:2015, 192-01-04*.

supervised lines

Lines or sidings that are under the control of the ground frame operator.

supervised location (SvL)

Could be defined on-board as the end of the overlap, the Danger Point, or the End of Authority.

supervising point

The location from which one or more automatic crossings are supervised to ensure that they are working correctly.

supplementary response time (SRT)

The assessed amount of extra time that the SSC adds to the BRT to determine the MRT value for a specific lineside signalling asset.

supplier

The generic term for any organisation or individual that provides, supplies, or seeks to supply, products and services.

Note: The word contractor may be used to mean the same, particularly with regards to construction.

suppression [AWS and TPWS trainborne subsystems]

A state of the trainborne sub-system where it does not provide operational outputs to the driver or initiate brake demands, for example when an alternative train control system is in use and AWS indications and TPWS interventions are not required. The system is still active in monitoring its status and may indicate fault conditions.

suppression [AWS magnets]

The application of an opposing magnetic field to an AWS permanent magnet to prevent the detection of the permanent magnet when a train is not required to receive an AWS indication.

surface gloss

A characteristic of a surface that influences the level of luminous intensity resulting from specular reflection and diffuse reflection, measured in gloss units (GUs).

swing nose crossing

A common crossing in which the crossing vee can move laterally to close the flangeway to one or other of the wing rails to provide continuous support to wheelsets. This type of crossing does not require the use of check rails. A swing nose crossing counts as one point end.

switches and crossings (S&C)

Sometimes points and crossings. All the ironwork associated with a set of points. It covers switch toes, switch rails, heels of switch rails, closure rails, stock rails, crossings and check rails.

System Failure mode (SF)

ERTMS/ETCS on-board equipment mode entered when a fatal failure which could affect safety is found.

system requirements specification (SRS)

A technical specification translating the FRS requirements into a technical solution.

system safety integrity level (System SIL)

A classification number which indicates the required degree of confidence that an integrated system comprising hardware and software will meet its specified safety requirements. Source: *BS EN 50128:2011*

system status information

Information conveyed by the lineside signalling system concerning the operational status of a system or infrastructure feature that is designed to be monitored by users.

systematic failure

A failure that occurs repeatedly under some particular combination of inputs or under some particular environmental or application conditions. Source: *CSM RA*

systematic fault

An inherent fault in the specification, design, manufacturing, installation, operation or maintenance of the system under assessment. Source: *CSM RA*

system

Any part of the railway system which is subjected to a change whereby the change may be of a technical, operational or organisational nature. Source: *CSM RA*

system

A set of sub-systems that interact according to a plan. Source: *BS EN 50129:2003*

T

T_NVCONTACT

An ETCS variable that is used for setting the maximum time without new ETCS 'safe' message.

T_NVOVTRP

An ETCS variable that is used for setting the maximum time for overriding the ETCS train trip.

target distance

The computed distance from the location of the train to the intended point of enforcement of one or more of:

- a) an enhanced permissible speed
- b) a permissible speed
- c) cancellation of tilt enable.

It is derived by the system on the train from distance data received from the trackside, usually applying from the location of a specific balise. It is decreased as the train moves forward by the distance travelled beyond that balise as measured on the train.

Target Speed Monitoring (TSM) [ETCS]

No definition.

target speed

The value of speed that the train should achieve or be less than at the target distance.

TCA interference detector (TCAID)

A device that detects the signal which is emitted by a TCA and conducted along the rails and then operates the track circuit independently of the train by applying a short circuit across the rails.

technical compatibility

An ability of two or more structural subsystems or parts of them which have at least one common interface, to interact with each other while maintaining their individual design operating state and their expected level of performance.

Technical Specification for Interoperability (TSI)

A specification adopted by the European Commission to cover each subsystem or part subsystem to meet the essential requirements and ensure the interoperability of the EU rail system.

technical system

A product or an assembly of products including the design, implementation and support documentation; the development of a technical system starts with its requirements specification and ends with its acceptance; although the design of relevant interfaces with human behaviour is considered, human operators and their actions are not included in a technical system; the maintenance process is described in the maintenance manuals but is not itself part of the technical system. Source: *CSM RA*

telecommunications objective speech quality assessment (TOSQA)

An objective speech quality algorithm that is strongly based on the ISO model for the Zwicker model of calculation of speech loudness.

television line (TVL)

No definition.

temporary installation

An installation that is not intended to become a fixed installation, regardless of the length of time.

temporary non-compliance (TNC)

No definition.

temporary speed restriction (TSR)

A speed, less than the permissible speed, applied for a pre-planned period not normally exceeding six months.

terrestrial trunked radio (TTR)

No definition.

test token

An electronic token that can be issued to and returned from a display unit for test purposes, but which does not give any movement or occupational authority.

thin film transistor (TFT)

No definition.

Tilt Authorisation and Speed Supervision System (TASS)

The system that authorises the use of tilt mode by sending messages from on-track beacons to an on-board reader. The onboard system also supervises the speed of the train.

tilt authority

An output to the tilt control system that permits the train to be tilted.

tilt control system

A train system that operates and controls the tilting of the vehicle body fitted to tilting trains.

tilt enable and supervision system

A system that enables and supervises the operation of the tilt control.

tilt enable

The information passed from the tilt enable and supervision system to the tilt control system that the latter requires in order to operate.

tilt prohibited section

A section of route where, to maintain clearances, operation of a tilting train in tilting mode is prohibited.

tilting train

A train having a system which tilts the train body to reduce the lateral acceleration experienced by passengers when operating around curves, allowing the train to run at higher speeds through curves than non-tilting trains.

time division duplex (TDD)

No definition.

time division multiple access (TDMA)

Radio access mode used for second generation mobile (GSM, PDC, IS-136).

Time Division-Code Division Multiple Access (TD-CDMA)

A hybrid access technology combining TDMA and CDMA, as applied for the TDD Mode of UMTS, and using a 5 MHz frequency band.

time to first fix (TFFF)

No definition.

time to fix (TTF)

No definition.

time zone (TZ)

No definition.

timing point location (TIPLOC)

A named location for which a time is specified on the train's schedule.

timing point

A named location on the railway and the time associated with it on a train's schedule. A Timing Point may correspond to an arrival time, departure time or passing time.

token control point

A location other than a signal box where a token or one-train staff may be obtained, returned or exchanged.

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.

token exchange (TOKEX)

The process of transferring a single line token or one-train staff between the signaller or single line instrument and the driver.

token overlap

The token overlap is defined as being the running line from the stop board or signal at the commencement of the single line section to the clear-of-loop marker board in the same direction of travel.

token section

A designated section of running line between and including token exchange points, operated under the RETB system of signalling.

tokenless block section

A section of single line extending, in each direction of travel, between the last stop signal (that is to say, the section signal) controlled from one signal box to the first stop signal (that is to say, the home signal) controlled by the next signal box. The section signal OFF aspect is the authority to enter the block section.

TOSQA Mean Opinion Score (TMOS)

Derived from a TOSQA value, a specific unit employed to define the resulting speech quality score.

total obscuration time

The sum of obscuration times on each signalled approach to a lineside signalling asset.

touch screen

A type of VDU display using the display area for inputs by means of programmable sensitive areas.

TPWS miniature loop

A TPWS transmitter loop smaller than the standard loop, which is used at OSS installations on the approach to buffer stops and certain other locations where speeds are low.

TPWS standard loop

A TPWS transmitter loop of standard dimensions, which is used at all TSS installations and at most OSS installations, except on the approach to buffer stops.

TPWS temporary isolation switch

A switch provided in the cab whereby the TPWS can be temporarily isolated.

TPWS-E

A proposed modification of Train Protection and Warning System (TPWS), which offers an identical functional capability to the current system but based upon the European balise. The solution was considered as one of the migration paths of upgrading TPWS to ETCS. However, the concept has not been taken forward, apart from a few trials.

traceability

Degree to which a relationship can be established between two or more products of a development process, especially those having a predecessor/successor or master/subordinate relationship to one another. Source: *BS EN 50128:2011*

track circuit assister (or actuator) (TCA)

A device mounted on a rail vehicle to assist with the reliable operation of track circuits by inducing an electrical potential between the associated wheelset and the rail head. Typically, a TCA consists of a control unit (installed in the vehicle), and aerial with associated tuning unit (mounted between a pair of wheelsets, close to the rails), and associated cabling and power supplies. Source: *GKGN0628*

track circuit block (TCB)

A method of working trains in a section of line where safety is ensured by the use of continuous track circuits or other means of train absence detection and without the requirement to visually confirm that trains are complete.

track circuit (TC)

A type of train detection system that detects the presence or absence of a rail vehicle within a defined section of track, by means of the electrical circuit created between the running rails by one or more wheelsets.

track connection unit (TCU)

A connection unit used in TI 21 / EBI track circuit.

track section

A portion of railway track having fixed boundaries and for which the train detection system provides information on its state of occupancy, which can be made up of one or more train detection sections (for example, track circuit or axle counter sections).

track subsystem [TPWS]

The TPWS track subsystem comprises the components mounted on the track or at the trackside that are used to provide the train stop system (TSS) and OSS functionality.

track tuning unit (TTU)

A tuning unit used in TI 21 / EBI track circuit.

trackside radio control module (TRCM)

No definition.

trackside radio control unit (TRCU)

No definition.

traffic management system (TMS)

A system that can automatically set routes for trains, log train movements, and resolve potential conflicts.

traffic management (TM)

No definition.

train completeness

Confirmation that the train is complete after it has arrived at the end of a block section.

train consist

The total number, type and formation of rail vehicles that make up a train.

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 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 GERT8000.

train describer (or description) (TD)

No definition.

train detection system

Equipment and systems forming part of, or providing input to, the signalling systems to detect, either:

- The presence or absence of vehicles within the limits of a track section
- That a train has reached, is passing, or has passed a specific position.

train dispatch

Systems, equipment, procedures and instructions intended to ensure the safe departure of a train from a platform.

train formation

A group of vehicles which may include individual vehicles or units formed to make up the operational train.

train headcode

The train reporting number shown in the working timetable.

train operated warning system (TOWS)

An audible warning system at locations listed in the Sectional Appendix. When switched on, it is used to warn personnel on or near the line about an approaching train.

Train Operating Company (TOC)

No definition.

Train Protection and Warning System (TPWS)

A system mitigating Signals Passed At Danger and non-respect of permissible speeds.

Train Running Number (TRN)

The identity of the train service. GB Rail currently uses a 4-character headcode, but may be expected to migrate to an identifier which is unique across the network, and not repeated within a 24-hour period.

train specific data

Parameters which determine the behaviour of a particular train, including train length, mass, maximum speed, braking parameters, traction parameters, resistance coefficients. Some parameters are rolling stock limits (for example, maximum speed) and others are RU policy (driving parameters – acceleration/deceleration).

train stop system (TSS)

A TPWS facility whose function is to initiate a brake application on a train that passes a signal at danger without authority.

train subsystem

The TPWS train sub-system comprises the components mounted on vehicles that are used to provide TSS and OSS functionality.

train-on-train collision

An instance of a train striking another train or train vehicle when this is not authorised (for example, when coupling is not the intention).

train-to-shore networks

These provide wireless communications between a train and a fixed communications infrastructure.

train

An operational formation consisting of one or more units. Source: *LOC&PAS NTSN*

trainborne equipment

Signalling and operational telecommunications equipment carried on rail vehicles, which has an interface with train control and communications elements of fixed infrastructure.

trainborne sub-system

The trainborne part of a control, command and signalling (CCS) system that also includes a corresponding infrastructure sub-system.

trains, drivers [taking possessions by the use of tokens]

All forms of traction unit and, where appropriate, to road-rail vehicles and their operators and to engineering personnel.

Trans-European Transport Network (TEN-T)

No definition.

transient

Pertaining to or designating a phenomenon or a quantity which varies between two consecutive steady states during a time interval short compared with the time-scale of interest. Source: *IEV 702-07-78*

transition zone

The section of line over which the transfer of control between signalling systems occurs.

transition

The safe transfer of control of a train from one signalling system to another.

transmitter breakthrough

A voltage or current originating from the transmitter/feed of one train detection section, which is detectable by a track circuit relay/receiver of a different train detection section.

transmitter

A device which can transmit radio waves into the surrounding environment.

Transport for London (TFL)

No definition.

transport operator

An infrastructure manager or railway undertaking.

transport undertaking

Any person who operates a vehicle in relation to any infrastructure but shall not include a person who operates a vehicle solely within an engineering possession. Source: *ROGS*

transportable token unit (TTU)

A self-contained radio and token handling unit. This is used for non-captive stock and for the protection of maintenance personnel in RETB signalled areas.

transposition bond

A jumper cable provided where track circuit polarities and / or traction return rails change sides across a pair of IRJs, or transposition joints.

transposition joint

An insulated rail joint (IRJ), where transposition bonds are used to transpose the traction and / or track circuit rails.

trigger delay

The pre-set period timed by the train sub-system and initiated by detection of an OSS arming frequency.

trigger frequency

A frequency generated by the TPWS track sub-system which, when detected by the vehicle, triggers the train sub-system.

Trip mode (TR)

ERTMS/ETCS on-board equipment mode (e.g. entered when passing an EOA), resulting in an application of the emergency brake that can only be revoked at standstill and with additional precautions.

typeface – BS 3693B:1964

A typeface approved for use. BS 3693B:1964 has been withdrawn. The current version BS 3693:1992 does not contain the required information.

typeface – rail alphabet

A typeface approved for use, designed by Kinnear & Calvert for the British Railways Board in the 1960s.

U

Ultra High Frequency (UHF)

No definition.

UMTS terrestrial radio access (UTRA)

No definition.

Unfitted mode (UN)

ERTMS/ETCS on-board equipment mode allowing a fitted train to run in an unfitted area.

unguided length

The length within an obtuse crossing where the wheel has no flange guidance and is dependent on frictional guidance alone.

uniformity

The ratio of the minimum illuminance to the average illuminance over a specified surface.

Union Internationale des Chemins de Fer (UIC)

Railway standards organisation now known as The Worldwide Railway Organisation.

United Kingdom (UK)

No definition.

Universal Mobile Telecommunications System (UMTS)

3G system standardised by ETSI under 3GPP along with other regional standards organisations.

Universal Resource Indicator (URI)

No definition.

universal serial bus (USB)

No definition.

unsignalled line

A line that is not fitted with a signalling system.

Unstructured Supplementary Service Data (USSD)

The Global System for Mobile communication technology that is used to send text between a mobile phone and an application program in the network.

U_n

Nominal supply voltage on charge.

upper quadrant position

A display comprising either a semaphore signal arm or an arrangement of lit display elements, aligned so that the left-hand end of the display is positioned above the right-hand end of the same display, when viewed from the front.

user [of a level crossing]

A person who uses a level crossing on foot, cycle, horse, car, lorry or herding animals.

user identification number (UIN)

Describes the number identified by the call type.

user to user information element (UUIE)

Used for the transfer of the terminal's own functional number towards the called party and vice versa.

user to user signalling 1 (UUS1)

Service that allows a mobile subscriber to send/receive a limited amount of information to/from another public mobile land network or ISDN subscriber over the signalling channel in association with a call to the other subscriber.

user

The railway undertaking personnel requiring the protection afforded by the protection system.

UTC (Coordinated Universal Time)

No definition.

V

V_NVALLOWOVTRP

An ETCS variable that is used for setting the maximum speed limit allowing the driver to select the ETCS 'override EoA' function.

V_NVKVINT

An ETCS variable that is used for setting the speed step used to define the ETCS integrated correction factor Kv.

V_NVLIMSUPERV

An ETCS variable that is used for setting the permitted speed while operating in ETCS Limited Supervision mode.

V_NVONSIGHT

An ETCS variable that is used for setting the permitted speed while operating in ETCS On Sight mode.

V_NVREL

An ETCS variable that is used for setting the permitted speed while operating in ETCS Release Speed mode.

V_NVSHUNT

An ETCS variable that is used for setting the permitted speed while operating in ETCS Shunting mode.

V_NVSTFF

An ETCS variable that is used for setting the permitted speed while operating in ETCS Staff Responsible mode.

V_NVSUPOVTRP

An ETCS variable that is used for setting the permitted speed limit to be supervised to, when the ETCS 'override EoA' function is active.

V_NVUNFIT

An ETCS variable that is used for setting the permitted speed while operating in ETCS Unfitted mode.

validation [software]

A process of analysis followed by a judgment based on evidence to determine whether an item (for example, process, documentation, software or application) fits the user needs, in particular with respect to safety and quality and with emphasis on the suitability of its operation in accordance with its purpose in its intended environment. Source: *BS EN 50128:2011*

variable SPAD probability model (Vari-SPAD)

A series of structured questions used to support the stage 2 signal overrun risk assessment.

vehicle identification

The unique code that identifies each railway vehicle.

vehicle on line (VOL)

No definition.

vehicle

An individual vehicle or car of any train formation.

verification [software]

A process of examination followed by a judgment based on evidence that output items (process, documentation, software or application) of a specific development phase fulfil the requirements of that phase with respect to completeness, correctness and consistency. Source: *BS EN 50128:2011*

very high frequency (VHF)

No definition.

virtual button

A button which achieves its function by touch screen activation.

visibility

The ease and reliability with which something can be seen throughout the range of applicable operational and ambient conditions, within the operational context and while the observer is performing typical required duties. This ranges from never visible to always visible. Visibility is a precursor to readability.

visible [lineside signalling asset]

The ease and reliability with which signal aspects, indications and signs can be detected by an authorised user throughout the range of operational and ambient conditions applicable to that hardware, within the operational context and while performing typical required duties. This ranges from never visible to always visible.

vision

The actual 'seeing' of raw, visual information. Vision is a 'bottom-up', or 'data-driven' process determined by the physiological function of the eyes and optic nerve.

visual cue

A visible feature that provides an accurate source of information to inform understanding of what action might be needed.

Voice Broadcast Service (VBS)

The VBS enables a calling subscriber to send speech unidirectional and simultaneously to all entitled signallers and to destination subscribers belonging to a predefined group call area who have a subscription to the applicable group ID.

Volt-Amp reactive (VAr)

The unit of reactive power.

voltage standing wave ratio (VSWR)

The VSWR of an antenna is the ratio of the maximum voltage to the minimum voltage along a transmission line. It is the measure of the mismatch between the load and the line and is sometimes used as an alternative measure to the return loss. A VSWR of 1.0 is a 100 % efficient antenna, a VSWR of 1.5 is 97 % efficient, and a VSWR of 2.0 is 89 % efficient.

volts (V)

No definition.

W

Weekly Operating Notice (WON)

The official printed notice which includes advice to drivers of temporary speed restrictions and alterations to permissible speeds.

West Highland Line (WHL)

No definition.

wheel slide protection [or protection] (WSP)

A system designed to make the best use of available adhesion between wheels and rail by a controlled reduction of the brake force.

wheel speed sensor (WSS)

No definition.

wheelset

A complete unit comprising an axle and two complete wheels together with any gear wheels, brake discs, etc, but without axle bearings and their end caps, spacers, seals and other associated fittings. The wheels may be either tyred or monobloc.

Wi-Fi (wireless fidelity)

A wireless networking technology that uses radio waves to provide wireless high-speed internet and network connections.

Note: Any Wireless Local Area Network (WLAN) product based on the Institute of Electrical and Electronics Engineers' (IEEE) 802.11 specifications.

wide area network (WAN)

No definition.

wideband CDMA (WCDMA)

Also known as CDMA DS (Direct Sequence) within the IMT-2000 framework – is the radio access technology for one of the UMTS access modes (UTRA FDD) using 5 MHz duplex channels. Combines circuit mode and packet mode initially.

wild card number

A set of digits reserved for special use.

window

A presentation of objects, text messages, input fields and/or buttons related to a single topic.

Wired Equivalent Privacy (WEP)

An encryption standard.

wireless local area network (WLAN)

A generic term for different high speed radio access modes currently commonly in the 2.4 GHz frequency bands but the 5 GHz band is being used increasingly commonly. Harmonised with HIPERLAN in IEEE 802.11j.

work in progress (WIP)

No definition.

World Geodetic System 1984 (WGS84)

No definition.

worldwide operability for microwave access (WiMAX)

Describes broadband wireless networks offering mixed, nomadic and portable access based on the IEEE 802.16 standard.

X

X.509

ITU-T standard certificate format for public key infrastructure (PKI).

XML (eXtensible Markup Language)

No definition.

Y

yellow bond

A current carrying bond, connecting the traction power supply system to the running rails and also carrying signalling circuits.

Z

There are no entries under 'Z'

Section B

This section contains glossary entries from the withdrawn GKG0802 issue 1 Glossary of Signalling Terms that are not already listed in Section A.

A

absence switch

A switch which, when operated, allows a signal box to be un-staffed for a period, by registering telephone calls to that signal box, usually during quiet periods.

absolute block

A system of controlling rail traffic, where (under normal operations) only one train is allowed in the block section at a time. Proof of a section clear normally involves the observation of the train tail lamp by the signaller.

acceptance

A block signalling term where a train is permitted to proceed towards the 'accepting' signal box. Block regulations provide for circumstances under which a signaller may accept a train.

accommodation level crossing

A private vehicular level crossing connecting land in the same ownership separated by a railway line.

achievable reading distance

The maximum reading distance that can be reasonably practicably achieved.

active warning

A device which warns users of the imminent arrival of a train. Such devices may be either visible or audible.

advance

Alternative term for 'beyond'.

Advance Warning Board (AWB)

A sign incorporating a St. George's cross provided on the approach to certain automatic level crossings to inform the driver to regulate the speed of his train in order to observe the restriction of speed which applies from the subsequent special speed restriction board. Also referred to as a level crossing warning sign.

advanced starting signal

In block signalling, a stop signal beyond the start signal, and worked from the same signal box . An alternative term for section signal.

Advanced Warning Indicator (AWI)

No definition.

alias plate

A plate which indicates the radio identification number for a signal, in cases where this differs from the signal number.

Aligning [a signal or element]

The process of re-directing the beam centre-line of the device to pass through the alignment point.

Alignment [of signal or element]

The line (in three-dimensional space) of the beam centre-line.

alignment point

A spatial reference point, through which the centre-line of the beam emitted by a signal or element should be directed, so as to achieve satisfactory visibility. The alignment point is specified in terms of its height above rail level and its offset relative to the left-hand rail, at a particular distance from the signal.

alignment target

A physical object used during the aligning process to mark the alignment point.

all signals on

A signaller's control device that places or maintains all signals in a designated area to danger.

alphanumeric route indicator

A route indicator that conveys its information by illuminated alphanumeric characters. The indicators are designated 'standard' and 'miniature' as a reference to the readability categorisation of the indications.

Angle of Depression [of signal or element]

The angle between the centre-line and the horizontal plane, in a situation where the beam is inclined downwards away from the signal.

Angle of Elevation [of signal or element]

The angle between the centre-line and the horizontal plane, in a situation where the beam is inclined upwards away from the signal.

annett's key/lock

A locking mechanism for releasing a ground frame. The key to unlock the ground frame is held captive in an Annett's instrument or lock which can be released remotely from the signal box and interlocked with the signalling.

annunciator

An audible indicator, for example a bell or buzzer in a signal box or gate box.

Another Train Coming Sign (ATC Sign)

A sign, provided at AOCL on double lines, which is illuminated after the passage of a train to warn road users of the imminent approach of a second train.

anti-preselection

The prevention of preselection of a signalling function, thus maintaining the protection of the signalling system.

apparatus case [or cupboard]

A housing which is intended for unprotected outdoor use. It is usually of metal construction (or wooden if a cupboard), smaller than a building or REB and usually capable of being transported as a made-up unit.

application logic

Any technology based method that configures a product so as to provide site-specific command and control instructions. This includes mechanical logic, electro-mechanical logic, electronic switching or code.

approach control

The restriction of the aspect of a signal, to ensure that the driver can comply with the turnout speed, or to control the speed of a train for a warning call-on, shunt or POSA class route. An alternative term for 'approach release'.

approach lighting

The lighting or illuminating of a signal only on the approach of a train. If no train is approaching, no light is displayed.

approach to

In relation to equipment on or alongside the track, positioned such that a train passes the point before reaching another defined item of equipment. An alternative term for 'rear'.

approval and issues record (AIR)

A summary sheet created at the start of a signalling alteration, for version control purposes, to track approvals, issues and modifications.

area of conflict

A section of line beyond the signal at danger on which a head-on, crossing or same direction converging collision with another legitimately positioned train could occur in the event of a SPAD.

aspect

Any valid visual indication of a signal as displayed to the driver.

aspect level

The level of interlocking required to be satisfied before a signal can display a proceed aspect.

aspect sequence

The order of the displayed aspects to give the driver information about the aspect of the signal or signals ahead.

aspect sequence chart

A diagram, used during testing, showing the sequence of the aspects displayed at successive signals.

audible warning

An audible tone or bell that is sounded when the level crossing protection system is activated.

automatic function

A function that, under ordinary operation, is operated automatically by the passage of trains and is not interlocked with any other signalling function. The function is generally associated with a particular signal box from which its operation is supervised, unless some form of local monitoring is provided.

automatic half barrier crossing (AHB / AHBC)

An automatic level crossing equipped with half-barriers, road traffic signals and telephones communicating with the supervising signal box. The correct operation of the crossing equipment is monitored by the signaller.

automatic open crossing locally monitored (AOCL)

An automatic level crossing equipped with road traffic signals at which the correct operation of the crossing equipment is monitored by the train driver. Barriers are not provided.

automatic open crossing remotely monitored (AOCR)

An obsolescent type of automatic level crossing, similar to an AHBC but without barriers.

automatic resetting and restoration to service

A self-checking process where no action is required by the signaller or engineer, which ensures correspondence between the signalling system and the actual state of the railway.

automatic signal

A signal controlled by the passage of trains. It does not require any action by the signaller or automatic route setting. Automatic signals are usually passable.

automatic track warning system (ATWS)

A system that gives trackside staff audible and/or visible warning of the approach of trains independently of the signalling system.

automatic train control (ATC)

Used to describe on-board automation that contributes to or replaces the driver's judgement as to how to control the train. (ATC=ATO+ATP).

automatic train operation (ATO)

A high reliability system that automatically operates the train's driving controls in accordance with information usually received from the trackside signalling equipment or traffic control system.

auxiliary [optical system]

Duplicate lamp or filament on hot or cold standby.

axis [of signal element]

An imaginary straight line extending out from the centre of the display, perpendicular to the plane of the surface of the display.

axle counter

A method of train detection. Track mounted equipment counts the number of axles entering and leaving a track section at each extremity. A calculation is performed to determine whether the track section is occupied or clear.

B

backlight

An aperture provided at the rear of certain lamps, usually on semaphore signals or ground position light signals to enable the signaller to see that the signal is on and lit.

backlocking

Prevention of completion of a lever stroke to the fully normal position until the conditions required by the interlocking are satisfied.

balise encoder programming and test tool (BEPT)

A test and programming tool for use with the TASS track equipment.

banner repeating signal

A signal that provides the driver with preliminary information about whether a signal is ON or OFF, usually provided where sighting of that signal is inadequate.

barrier [level crossing]

A device pivoted at the side of the road, which is lowered when required to close the road to enable trains to pass.

barrier control pedestal

A separate operating console located in view of the level crossing under operation.

barrier pedestal

A structure supporting the boom and containing the motor and hydraulics equipment.

barrier skirt

The lattice (metal or plastic) attached to the barrier boom at some full barrier crossings, designed to reach the floor when the barriers are in the 'down' position. It enables the railway to be fenced off when using full barriers.

barriers up indicator

An indicator provided beyond a traincrew operated crossing (TMO) crossing to indicate that the barriers have raised after the passage of a train.

barrow crossing

A crossing (often at the end of a platform) for staff use. Protection, if provided, is by means of white lights that are lit when it is safe to cross.

bay line

A dead-end line adjacent to a bay platform at a through station.

bay platform

A generally shorter platform at a station that serves a dead-end line, usually at a through station.

Beam [of light emitted from signal element]

An envelope of space within which the light Intensity is at least 50 % of the intensity on the centre-line at the same distance from the signal.

berth

A location where a train description may be displayed by the train describer and which is normally associated with a signal.

berth track circuit

The track circuit that is immediately on the approach to a signal.

beyond

In relation to equipment on or alongside the track, positioned such that a train reaches it after passing another defined item of equipment. Alternative term for 'advance'.

bi-directional line

A line on which the signalling permits trains to be signalled normally in either direction.

bi-directional signalling

Signalling which permits trains to be signalled normally in either direction on a running line.

blinder

A plate that covers a backlight to enable the signaller to see that a semaphore signal has correctly cleared to the OFF position.

block bell

A single stroke bell for communicating between control points by means of a code of audible signals.

block indicator

The part of the block instrument that provides the signaller with a continuous visual indication of the state of a line within a block section.

block instrument

The equipment in a signal box for the operation and indication of block signalling.

block joint

Joints that join rails together mechanically but not electrically. Also known as an insulated block joint.

block override

A feature of absolute block enabling a line clear to be normalised without requiring a train to pass through.

block post

A signal box at one end of a block section in block signalling.

block shelf

A shelf provided above the lever frame to hold equipment associated with control of the line, for example block instruments, indicators and other ancillary signalling equipment.

block signal

A stop signal that controls the entrance to, or signifies the termination of, a block or signal section.

block signalling

A system of controlling rail traffic defined by block sections. Normally only one train is permitted in a block section.

block switch

A switch located in a signal box by means of which the signalling block circuits to the signal boxes on either side may be connected together, enabling the signal box in which the switch has been so operated to close.

blocking back

Term used in absolute block and electric token block, when a train or shunting movement is to be allowed to occupy the line within the clearing point or on the approach to the home signal.

blocking back [level crossings]

The formation of a stationary or slow-moving queue of road traffic over a level crossing due to road traffic conditions causing obstruction of the railway line.

bonds or bonding

The generic term for electrical connections and cabling for track circuit feed and relay end connections, cross bonds, structure bonds and impedance bonds.

boom

Alternative term for barrier.

boom lights

Small red lights that are provided along the length of a barrier.

braking curve

A graphical representation of the braking distance of a train in relation to the gradient, the braking characteristics and speed of the train.

braking distance [emergency]

The distance in which a train is capable of stopping in an emergency. Dependent upon train speed, train type, braking characteristics, train weight and/or gradient.

braking distance [service]

The distance in which a train is capable of stopping, from a given speed, at such a deceleration for a passenger train that the passengers do not suffer discomfort or alarm, or at an equivalent deceleration in the case of non-passenger trains.

bridleway

A path designated for horse riders and pedestrians.

brightness

An individual's perception or sense of the strength of light entering the eye. The perceived brightness of a given region mainly depends on the luminance contrast between the region and its surroundings.

buffer stop lights

Red or white lights (usually two, one above the other) mounted on the buffer stop or at the start of the sand drag.

C

cab secure radio (CSR)

A secure radio communication system between driver and signaller.

cable route

The position of the principal path of signalling and power distribution cables. Generally laid in troughing.

call-by

The authority given by a signaller to a driver to pass a signal at danger.

calling-on signal

A subsidiary signal used in semaphore signals for movement into an occupied section.

call-on [route class]

A route that is provided to permit a train movement into a section known to be occupied.

cancelling indicator [AWS]

A lineside sign which denotes that an AWS warning does not apply to trains in that direction.

cantilever

A structure that incorporates an overhang, to position a signal head for signal sighting purposes.

cascaded cut section [track circuit]

An obsolete arrangement for a cut section track circuit in which the relay of one section is used to control the feed to the next section.

catch points

Points provided to derail vehicles running back on rising gradients. The points may only be unworked if traffic is in one direction only.

Caterham locking

The normal lie of points at a suburban or rural terminal station that directs potential runaway trains onto an appropriate line to avoid a head-on collision.

cattle-cum-trespass guard

A device provided adjacent to the level crossing surface to deter animals and/or pedestrians from straying onto the railway.

caution [aspect]

An aspect which advises the driver that the next signal may be at danger. It is indicated by a single yellow (Aspect) or a semaphore distant arm horizontal.

centre-line [of beam]

The line (usually extending out perpendicular from the face of a signal) along which the intensity of light is greatest at a given distance from the signal. For practical purposes this corresponds to the axis of the signal element.

check locking

An arrangement to prevent the full stroke of a lever in a lever frame until such time as the apparatus controlled by that lever has completed its movement.

chord

A straight line drawn between two points on a curve. Used in calculations relating to cant and curvature.

chromaticity [of a source of emitted light]

The co-ordinates of a colour which may be plotted on the 1931 CIE (Commission Internationale de l'Eclairage) chromaticity diagram to graphically represent the colour in question.

circuit controller

A circuit switching device containing a number of contacts, each of which may be adjusted to make or break separate circuits when operated by a lever or signal. May be combined with a lever lock.

clamp lock

A point operating mechanism which locks the points by directly clamping the closed switch rail to the stock rail.

clear [aspect]

A colour light signal that is displaying a proceed aspect or a semaphore signal in the OFF position.

clear [track section]

The track section is clear of any train on a track circuit or a section is clear of axles.

clear weather conditions

Daylight visibility of 1000 m or better, where visibility is measured in accordance with recognised guidelines, such as those contained in the British Meteorological Office Observer's Handbook.

clearance bar

A depression (or lifting) bar used to prove clearance usually between converging routes.

clearing point

The point in block signalling beyond the home signal up to which the line must be clear before a signalled running movement can approach the home signal.

close viewing sector (CVS)

A specially moulded sector (of nominal angle 56°) in the front lens of a long-range colour light signal, that acts to deflect a proportion of the light away from the axis by a significant angle. The effect of the CVS is to render the aspect visible from the cab of a train when very close to the signal (typically within 20 m).

closing-up signal

A signal that is provided to optimise headways and/or to provide earlier clearance of junctions on the approach to stations. It may or may not form part of the normal aspect sequence.

closure list

Final index of design details issued to the tester-in-charge by the design organisation.

closure rail

A rail located between switch and crossing components, cut to a length to fit the requirements of the turnout.

co-acting signal

An additional signal that is provided in exceptional situations for sighting reasons. It is located in the same transverse plane as the primary signal and displays identical main aspects.

collar

A facility that prevents the signaller from operating an item of signalling infrastructure. Either a physical item preventing the pulling of a lever or operation of a button, or an electronic equivalent indicated on the signaller's workstation. The formal term for collar is 'reminder appliance'.

colour light signal

A signal that conveys its information by coloured lights.

common rail

The rail of a single rail track circuit that is electrically common to one or more adjacent track circuits or forms the traction return path. In non-electrified areas the common rail is bonded with track circuit bonding. In electrified areas the common rail is known as the traction return rail and carries the traction return current. It is therefore bonded with traction return bonding.

comprehensive approach locking

Approach locking including controls that will allow the immediate release of approach locking if no train is approaching the signal. It uses look back logic to ascertain the line occupancy between a given signal at danger and the sighting point of the signal displaying the first caution aspect for the signal under consideration.

concentrator

A facility to connect several telephone circuits to one handset.

conditional locking

Interlocking between two signalling functions that are dependent upon the state of other signalling functions.

conflicting locking

Interlocking between two routes that require one or more points set in opposite positions.

control area

The area of the railway controlled or supervised by a particular signal box or control centre, as defined by the signalling plan.

control centre

A signal Box covering a large area, usually incorporating other operational functions.

control device

A lever, switch, signalling panel button, VDU monitor target etc which is operated by the signaller to set points and routes, clear and replace signals and operate other signalling functions.

Control of Substances Hazardous to Health (COSHH)

Control of Substances Hazardous to Health Regulations 2002.

control point

A signal box, including a control centre, gate box or ground frame.

control table

A part of the signalling system specification that defines the detail of the signalling controls for each signalling function.

controlled signal

A signal that is cleared from red (other than by emergency replacement switch or signal post replacement switch) from a control point by a signaller or ARS on each occasion it is required to show a proceed aspect. controlled signals are usually plated as non-passable.

controlled signal working automatically

A control function (generally coloured blue and/or annotated 'A') that enables a controlled signal to work Automatically. Another term for 'auto working (of a controlled signal)'.

converse locking

The provision of locking between functions to ensure that conditions cannot be broken down, that is if 1 locks 2, then 2 must lock 1. This form of locking is provided automatically by mechanical interlocking. Also known as reciprocal locking.

correlation

The comparison of the configuration and version status of a system with the design records to ensure that the two are in agreement.

correspondence

The agreement of the interlocking with the detected state of a signalling function.

counter conditional locking

Interlocking which prevents a condition (upon which other Interlocking is dependent) from being destroyed.

counting head

Wheel presence detection equipment that is fixed to the rail. Each counting head assembly consists of two counting heads and determines the number and direction of axles passing it.

crank handle

A portable handle for insertion in point machines to enable them to be operated manually.

cross bond

A jumper cable cross-connecting the common rails or centre points of impedance bonds of parallel tracks to form a mesh of alternate paths for traction return current.

crossing

A cast or fabricated portion of the track layout which enables the rails of the two tracks to cross each other, while still providing support and guidance for smooth passage of the vehicle's wheels.

crossing attendant

A person appointed, where required, to provide site supervision or control at a level crossing when it is necessary to place the crossing in local control, or to operate a temporary vehicular level crossing. This person is required to work under the instruction of the crossing keeper or signaller.

crossing keeper

A person appointed at a permanent gate box to carry out the normal operating procedure of a level crossing.

crossing time

Time taken for a user to traverse the crossing from the decision point to a position of safety on the other side of the railway. Crossing time includes time taken for the user to make the decision to cross.

crossover

Two turnouts connected to form a continuous passage between two parallel tracks.

cross-read [from one signal to another]

A type of misread error made when driving a train. To mistakenly read a parallel signal as being applicable to the train, instead of reading the applicable signal.

cut section [line circuit]

The sectioning of line circuits to avoid exceeding the maximum length allowed, for instance, in a.c. electrified territory.

cut section [track circuit]

A method of reducing the continuous length of a track circuit by the use of individual track circuits, but indicated as a single track section on the signallers panel. Also known as multi-section track circuit.

D

data [signalling]

Site specific geographical and control information in an electronic form, which may be of safety-critical nature or otherwise.

dead locking

Locking which is not conditional on any other control.

defective signal

A signal with a fault that affects its designed operation.

delayed yellow [aspect]

A signal to which approach control has been applied where speed must be reduced before the next signal, for example Warning (Route Class).

depression bar

A metal bar so mounted alongside the rail that it is depressed by the wheel flanges of a vehicle.

derailer

A safety device attached to a rail, that when passed over in the raised position, causes a derailment of a vehicle in an unauthorised movement.

design details

Any plans, control tables, engineering details and data that are required to sufficiently define the signalling system.

detected [points]

Physically proved in the normal or reverse position.

detonator

A small disc-shaped audible warning device, placed on the rail head, which explodes when a train passes over. Used for emergency or protection purposes. Also known as railway fog signals.

detonator placer

An appliance for placing one or more detonators on the running line.

diamond crossing

A crossing of two rail tracks.

direct opposing locking

Interlocking between two routes in opposite directions for which the lie of all points is the same.

direct track locking

Locking of movable components, for example, points when a train is present. This is not conditional on the points being set or locked.

direction lever

A non-token system of single line working usually requiring continuous train detection through the section. A form of track circuit block.

disc signal

A shunting signal or subsidiary signal consisting of a small disc which rotates to indicate a change of aspect.

disconnected signal

A signal that has been adjusted to ensure that it shows only the most restrictive aspect for one or more of its routes.

disconnection

The disconnection or restriction of use of signalling equipment agreed between maintenance and operations staff to enable work to be carried out on the equipment.

disconnection box

A small housing containing cable terminations to enable cable size changes or disconnections to be made.

display [in relation to the output from a signal]

The signal or element actually exhibited by the device, as determined by the signalling interlocking and controls.

disregard

Obsolete term for a SPAD error category, Group 2.

distant board

A reflectorised sign that is equivalent to a fixed distant signal.

disturbed [axle counter]

An interruption having occurred with the axle counter systems' ability to record the passage of axles. Although the equipment has returned to working order it cannot determine whether the track section is occupied. This results in the computer based interlocking system having an undefined state.

dog chart

A pictorial representation of the interlocking elements required to make-up mechanical locking. An alternative term for locking chart.

doll

A short post on a cantilever or gantry, on which is mounted one or more semaphore signals.

double junction

The point of junction of two double track routes. It comprises two turn outs and a diamond crossing.

double slip

A combination of a diamond crossing with four point ends without the need of separate crossings.

double yellow [aspect]

A preliminary caution displayed by a colour light signal in four aspect signalling informing the driver to expect the next main signal to be at single yellow.

draw ahead [aspect]

A position light subsidiary signal that instructs the driver to 'draw ahead', for example, sufficiently to enable a set back move over a trailing connection to take place. An alternative term for calling-on or shunt-ahead signal.

driver's eye level (DEL)

The vertical distance between the driver's eyes when in the normal, seated position, and the crown of the left-hand rail. (This may be a nominal value, representative of several types of driving cab and/or the variation in the population of drivers. Alternatively, for a particular scenario, it may be a specific, measured value. Unless special circumstances dictate, driving seats are assumed to be adjusted vertically to their mid-position.)

driver's level crossing indicator

A signal provided at certain types of level crossing to indicate to the train driver the state of the crossing equipment.

driver's line of sight [to an aspect or element]

Generally a lever lock contact internally wired in series with the coil such that the lock coil is not energised when the lever is in the full travel position. Alternatively the function may be controlled externally.

driver's red light

A signal that is displayed to a train driver approaching an ABCL or AOCL whenever the DWL is not lit.

driver's white light (DWL)

A signal that is displayed to a train driver approaching an ABCL or AOCL to indicate that the level crossing protection system has activated.

drivers reminder appliance (DRA)

A device in a driving cab to enable the driver to set a reminder. Whilst set it prevents the driver from taking power.

drop shunt

The maximum value of resistance which, when placed across the rails at the relay end of a track circuit will cause the relay to de-energise (that is, just break its front contacts).

E

economiser

Generally a lever lock contact internally wired in series with the coil such that the lock coil is not energised when the lever is in the full travel position. Alternatively the function may be controlled externally.

electric token block

A signalling system used on single lines controlled by the use of physical tokens, only one of which can be released from the instruments for a section at any one time. The released token is the prime authority to enter the token section.

electric token instrument

The equipment in a signal box for the operation of electric token block. Contains one or more electric tokens.

element [of a signal]

A single aspect of a main signal; or, a position light junction indicator; or, the character displayed by an alphanumeric route indicator; or, a single semaphore arm or disc; or, a single aspect (lamp) of a position light signal.

emergency alarm

A direct communication channel to alert a signaller in an adjacent signalling centre to an emergency. Provided in track circuit block territory as a replacement for emergency bell communication.

emergency indicator

A lineside sign that informs the driver of an emergency speed restriction ahead.

emergency release

A device, usually sealed, to permit the operation of a signalling function in case of emergency or failure.

emergency replacement switch

A switch or button located in the signal box that enables the signaller to replace an automatic signal to danger in an emergency. The signal is not proved to be replaced.

emergency signals on control (ESOC)

Provided (generally in areas controlled by CBI) to replace all signals to danger in an area controlled by an interlocking, either:

- in response to a traffic emergency, or
- where the interlocking fails to respond to commands.

empty coaching stock (ECS)

No definition.

engineering details

Design details from which a signalling system is constructed.

engineers line reference (ELR)

A unique Infrastructure reference for a particular section of track. Generally found in the Sectional Appendix or hazard directory.

entrance-exit system (NX)

A route setting system for a geographic location that is controlled by sequential selection of entrance and exit buttons (or equivalent devices). This action also initiates the setting of all points required by the route.

evaluator equipment

Computing equipment provided to compare the outputs from the counting heads located at the extremities of an axle counter section.

exit signal

The signal or buffer stop/board to which a train traversing a route is directed.

expectation

The driver's pre-conditioning, based on factors such as route knowledge and previous experience of the way that the signalling system behaves. Expectation can influence a situation prior to the train reaching a point where the signal can be seen, or with a signal visible, before a less restrictive aspect is displayed.

F

facing [direction]

The direction of rail traffic over points where the train meets the toe of the switch rail first.

facing point lock [economical]

A facing point lock mechanically operated by the same lever that operates the point switches (as distinct from a facing point lock operated by a separate lever).

facing point lock bar

A lifting bar to prevent the unlocking of facing points while a train is passing over them.

fail-safe

A design philosophy which results in expected failures maintaining or placing the equipment in a safe state.

false clear

A condition where a train detection section indicates the line is unoccupied when it is occupied by a train.

fibre-optic indicator

An indicator using optical fibres to provide the required illuminated indication. Uses include standard and miniature alphanumeric route indicators, close doors, right away and OFF indicators.

fibre-optic signal

A colour light signal that uses fibre-optic technology to combine the red, yellow and green aspects into one aperture to generate the appropriate aspect. Other uses include banner and position light signals.

first wheel replacement

A control applied to a signal which replaces it to its most restrictive aspect immediately after the front of the train has passed that signal.

fishplate bond

Provided to ensure electrical continuity between two rails mechanically connected.

fixate

To look at an object directly, so that the image of the object falls on the fovea of the retina of the eye, an area covering about 2° visual angle.

fixed distant signal

A distant signal that is only capable of displaying a caution.

flank points

Points which, if traversed by an overrunning train in the facing direction, could direct that train away from a route or overlap that has been set for an authorised train movement.

flank protection

Protection from overrunning movements approaching on converging tracks, usually by additional point interlocking or train detection.

flashing double yellow [aspect]

Displayed by a colour light signal, informs the driver to expect the next main signal at flashing single yellow.

flashing single yellow [aspect]

A preliminary caution displayed by a colour light signal informing the driver to expect the next main signal at single yellow with junction indicator set for a diverging route.

fog signal

Another term for detonator.

footpath level crossing (FP)

A level crossing that is designated only for pedestrians.

form [of a signal]

The particular combination of elements used to create a signal, and their positions relative to each other.

foul track circuit

A track circuit not in the direct line of a signal route with one of its extremities within the required clearance point.

fouling bar

A mechanically operated form of train detection activated by the flange of a wheel.

four aspect signal

A colour light signal capable of displaying four aspects.

four aspect signalling

A system of colour light signalling which provides red, yellow, double yellow and green aspects in a manner which normally provides a first caution at least two signals before a signal at red.

free-wired interlocking

A relay interlocking that comprises individually wired relays rather than pre-wired sets.

frequency division multiplex (FDM)

A data transmission system that uses unique frequencies to separate channels over a single pair of conductors.

fringe signal box

The first signal box located along a line beyond the boundary of a controlled area. An alternative term is 'fringe box'.

full barriers

Single or double barriers, provided at controlled level crossings, which extend across the whole width of a road. Barrier skirts may be provided.

full overlap

An overlap of at least 180 m (or 400 m where both the stop signal and the preceding caution signal are both semaphore signals).

G

gantry

A signal structure spanning one or more tracks and having two or more points of support.

gate [level crossing]

A device pivoted at the side of the road (or footpath/Bridleway) which is closed when required to enable trains to pass. The gate may close across the railway when the road is open.

gate box

A control point provided for the supervision of one or more level crossings which is not controlled directly by a signal box. A gate box is not a block post. An alternative term for 'cross box'.

gate stop [rail]

A device that holds the gate locked across the railway. Part of this device may be fixed.

gate stop [road]

A device that is normally flush with the road surface and rises as the gate approaches to hold the gate locked across the roadway.

gate stop lever

Lever that, when placed from reverse to the backlock ('B') position, lowers the rail stops and prepares the rising of the road stops. When placed fully normal, it locks the road stops in the raised position. Interlocked with the signalling.

gate wheel

A wheel provided in a signal box or gate box with which the signaller or crossing keeper operates the gates.

geographical interlocking

An interlocking in which standard pre-assembled modules are provided for each signalling function, arranged and electrically interconnected in a geographical manner.

goods line

A running line that is not required to be signalled to the standard required for passenger trains.

gradient

A measure of the rate at which the railway is inclined (rising or falling). Gradients are signed +ve (rising) or -ve (falling) in respect of the direction of travel.

green [aspect]

Displayed by a colour light signal, indicates to the driver that, in three or four aspect signalling, the next signal will be displaying a proceed aspect.

ground position light signal (GPL)

A position light signal mounted at ground level.

ground shunt signal

A shunting signal mounted at ground level.

ground switch panel

A ground frame which uses only switches and/or buttons as operating devices.

guaranteed power supply

Another term for secure power supply.

H

half-barrier

A barrier for closing the entrance to a level crossing to the oncoming road traffic, whilst maintaining open the exit from the crossing.

hand points

Points not interlocked and worked manually by an independent lever adjacent to the points.

handsignal

An indication given to the driver of a train during shunting movements or in other exceptional circumstances to control the movement of the train.

hazard and operability study (HAZOP)

A structured study to identify all deviations from design intent with undesirable effects on safety or operability.

headway

The shortest distance or time interval between two following trains, so that the second train can run at its normal operating speed without being restricted by the signal aspects.

heel

The end of the switch rail which is fixed in position.

height [of signal or element]

The vertical distance between the centre of the signal or element and the crown of the left-hand rail.

Her Majesty's Railway Inspectorate (HMRI)

A branch of the Health and Safety Executive which accepts Safety Cases, approves new works, enforces health & safety and investigates accidents.

high risk failure

A wrong side failure where no other part of the signalling system provides protection. Also known as an 'unprotected wrong side failure'.

hit area

The area of, and surrounding, a visual target which allows the entering of commands to a VDU based signalling control system.

home normal control (HNC)

The home signal lever is proved normal (and semaphore signal arm on where repeated) before the signaller can give line clear to the signal box in rear. This prevents the signaller giving permission for a second train to approach before replacing the home signal after the previous train. Also known as home normal contact.

hood

A cover placed above individual aspects of a colour light signal or route indicator to reduce phantom aspects due to sunlight. Where necessary, long hoods may be used.

horizontal half-beam angle [of light emitted from signal or element]

The angle between the beam centre-line and the line that represents 50% of the peak intensity, measured at the surface of the element in the horizontal plane.

horizontal line-of-sight distance [to signal or element]

The straight-line distance, measured in a horizontal plane, from the driver's eyes to the signal or element.

hot axlebox detector (HABD)

Equipment for detecting an overheated axlebox on a rail vehicle.

hydro-pneumatic points

Alternative term for 'train operated points'.

I

identify [a signal or element]

When viewing a signal or element, recognise it as being applicable to a particular line; correctly associate a signal or element with a particular line.

illuminated

The internal or external illumination of signalling equipment.

illuminated diagram

A signal box diagram on which track circuit and other indications are provided by means of lights on a representation of the track layout.

impedance bond

A device which presents a low impedance to traction current and a higher impedance to track circuit current.

in advance

Alternative term for 'beyond'.

in rear

Alternative term for 'approach to'.

independent position light signal

A position light signal not associated with a main signal.

indication locking

A form of locking whereby the full travel of the lever is inhibited until the operation of the function (for example points) is complete and detection is obtained. The levers function is achieved when the full travel of the lever is reached (for example, NBD-R lock).

indicator [signal box]

A visual device which displays the position or condition of an item of signalling equipment.

indirect opposing route locking

Two complete routes that are conflicting in that they require at least one set of points in a different position. However, cancellation of one route with a train part way through the route releases the locking on these points which, when they become free, create the conditions for direct opposing locking to be set. Indirect opposing locking is applied to prevent the setting of the route that has become opposing.

individual function switch (IFS)

No definition.

inductive loop warning system (ILWS)

A staff protection warning system where information is relayed by audible tones or personal vibrators via an inductive loop.

Insells lock

A means of holding a signal in advance of a diverging junction at red where there is a risk of misreading or reading through.

instruction board

A lineside sign in accordance with Railway Group Standards, for example Stop Board containing a message for the driver.

insulated block joint (IBJ)

An alternative term for Insulated Rail Joint.

integrated electronic control centre (IECC)

A computerised signalling control centre that usually incorporates SSI and ARS. Signalling indications, train descriptions and other information are displayed on VDUs, and routes are set by tracker ball, keyboard or automatically by ARS.

interlinking

Box-to-box controls to ensure enforcement of electrical sequential locking. Proving of home and distant on and berth clear before transmitting line clear and the acceptance of second train.

interlocking frame

An alternative term for Lever Frame.

isolate

To remove the power supply to an item of equipment.

J

joint hopping

Where fast-moving short vehicles pass from one track circuit to the next, the difference between the pick-up and drop-away times can cause the vehicle to momentarily be undetected.

jointless track circuit (JTC)

A track circuit which does not require insulated rail joints at its extremities. The extremities are defined by the use of electrically tuned zones.

jumper

An interconnecting cable (commonly single core) to provide electrical continuity.

K

key locking

The locking is transmitted from the interlocking frame (or equivalent) to the signalling function to be released by means of a key. It can be applied to ground frame points or level crossings.

key token

A type of token normally used for electric token block.

king lever

A lever which when operated alters the interlocking between other levers. It is usually provided for the purpose of switching out a signal box.

L

ladder junction

A sequence of points on a multi-track route arranged as a series of crossovers.

lamp proving

A system that ensures the required lamp(s) are lit, for example, by measuring the current drawn by the lamp(s).

last wheel replacement

A control applied to a signal which replaces it to its most restrictive aspect only after the whole train has passed that signal.

lateral position [of signal or element]

The horizontal distance of a signal or element from the running rails at a specific location on the track and the vertical position of a signal above railhead level. A combination of height and offset of the signal or element. The lateral position of an element is the position of the centre of its front surface.

left-hand rail (LHR)

The left-hand rail of the track to which a signal or element relates, as viewed from a train approaching the signal.

level crossing order

A legal document, made by the Secretary of State, which details the controls to be provided and the circumstances in which a level crossing may be brought into use.

level crossing predictor

A control system by which the position and speed of an approaching train may be determined, to activate the level crossing protection system.

level crossing protection system

The operation of road traffic signals and/or barriers/gates manually or by an approaching train.

level crossing warning sign

Alternative term for an 'advance warning board'.

lever [or switch] plate

An identification plate fixed to a lever (or adjacent to a switch), describing the lever / switch function together with the order of pulling details. Also known as pull plate, lever lead, tablet or badge.

lever [worked to maintain locking]

A lever not controlling any signalling function but remaining connected to the mechanical locking. It is not considered to be a spare lever.

lever bands

Contacts housed in a circuit controller that is associated with a lever.

lever frame

A frame in which the levers working signals and points in an area are mounted together and interlocked as required by the layout.

lever lead

Alternative term for lever (or switch) plate.

lever lock

An electro-mechanical mechanism fitted to hold (and release) the lever in a predetermined position. May be combined with a circuit controller.

light emitting diode [led] signal

A colour light signal that uses light emitting diode technology in place of incandescent lamps and coloured filters. LED signals can be arranged to combine the red, yellow and green aspects into one aperture to generate the appropriate aspect.

Lime Street Control

The ability to allow a permissive move to take place into an occupied platform by having suitably measured the second train and the space available. The lengths of signal approach and platform track circuits are designed to enable these controls to be performed.

limit of shunt indicator (LOS)

A special type of position light signal or sign to terminate a shunting movement along a line in the wrong direction.

line blocked (LB)

The normal state of a block section when no permission has been given for a train to enter it.

line capacity

For a given section of line, the practical maximum number of trains per hour permitted by the signalling system.

line clear (LC)

The state of the block section after a train has been accepted but before it has entered the block section.

line clear release

The signaller can only pull the lever for the section signal if line clear is obtained from the box ahead. The lever is released either for one pull or one train.

line-of-sight distance [to signal or element]

The straight-line distance from the driver's eyes to the signal or element. From the driver's perspective, this is the distance along the driver's line of sight.

loading / unloading indicators

Indicators that relay movement instructions to drivers when controlling trains in sidings. Also known as 'toton signals' or 'creep signals'.

local control unit (LCU)

Equipment provided at an automatic level crossing, CCTV, remotely controlled level crossing or other crossing to enable it to be manually operated locally.

local panel

A control panel provided for alternative or emergency control of signalling.

location [cases]

One or more signalling lineside apparatus housings at a particular site and the equipment contained therein.

lock slide

The part of the clamp lock point mechanism which unlocks, moves and re-locks the switches.

lock stretcher

A stretcher bar that is secured by a facing point lock.

locked

The state of any signalling function or item of equipment when it is conditionally or unconditionally prevented from changing state or position by other parts of the signalling system.

locking bar

A fouling bar, provided for mechanically worked facing points, that acts in conjunction with the facing point lock, preventing the unlocking of the points during the passage of a train. It has generally been superseded by more modern forms of train detection.

locking chart

A drawing showing in graphical form, the layout of mechanical locking for a lever frame.

locking level

The interlocking level where controls between signalling functions are required to be satisfied before a route can be set.

locking level release

Controls that are required to be satisfied before the locking on a route or a section of a route is released. Controls on conflicting routes are released by the train clearing track sections. If required, controls on opposing routes are released by the train timed to a stand on an appropriate track section.

lockout system

A system which allows a person requiring access to the track to provide personal protection by restricting or preventing the signalling of trains.

long route

A route combining one or more other routes.

long section token

A type of token covering more than one single line section, usually in radio electronic token block (RETB) areas.

longitudinal position [of signal or element]

The position of a signal along the track, usually specified in terms of miles, kilometres or yards.

low risk failure

A wrong side failure where another part of the signalling system provides an acceptable level of protection. Also known as a 'protected wrong side failure'.

lower quadrant

A term applied to a semaphore signal whose clear position is designated by the arm below horizontal.

luminosity

The density of luminous intensity in a particular direction. Luminosity is measured in lux. One lux is equivalent to one lumen per square metre.

M

main [route class]

Route from one main signal to the next that allows running movements. It requires the section and overlap to be clear.

main arm

An arm of a semaphore main signal controlling a running movement.

main aspect

An aspect displayed by a colour light or semaphore signal controlling a running movement.

main cable

A twin or multicore lineside cable carrying signalling functions or power supplies between apparatus cases or equipment rooms.

main signal

A colour light signal capable of displaying a main aspect or a semaphore distant or stop signal.

maintained locking

An alternative to the term 'route locking'.

maintainer's panel

An indication panel that repeats the indications set to the signaller and allows the maintainer to monitor the state of the interlocking. It generally contains additional fault condition indications.

maintainer's terminal

This commonly consists of a VDU, keyboard and printer, and is used to obtain essential fault diagnostic information. Alternative term for 'technician's terminal'

manned level crossing

A level crossing that is operated or supervised by a railway employee. Such as remotely controlled level crossing, traincrew operated crossing and manually controlled barriers.

manually controlled barriers (MCB)

A controlled level crossing with full barriers, operated by a control centre, signal box or gate box.

MCB With CCTV

Manually Controlled Barriers operated remotely via Closed Circuit Television.

mechanical

Operated without any form of power assistance.

mechanical locking

A method of interlocking where the components are movable metal pieces which physically lock and prevent the movement of one lever against another.

mid-platform signal

A signal provided to enable two trains to be positioned at a platform by the use of block signalling techniques. It may or may not form part of the standard aspect sequence.

miniature alphanumeric route indicator (MARI)

An alphanumeric display presented to the driver to indicate the route set. it is for short range use (category three performance). Formerly known as 'stencil Indicator'.

miniature arm

An arm of a semaphore signal which is smaller than a main arm controlling other than running movements.

miniature lever frame

A lever frame of miniature levers for the control of power operated signalling.

miniature red/green lights

Alternative term for 'miniature stop lights'.

miniature stop light crossing (MSL)

An Automatic level crossing equipped with red/green lights operated by approaching trains.

miniature stop lights (MSL)

Red/green indications for the crossing user at user-worked crossings, footpath crossings and bridleway crossings.

miniature warning lights (MWL)

Obsolete term for 'miniature stop lights'.

miscommunication

Obsolete term for a SPAD error category, Group 1.

misjudgement

Obsolete term for a SPAD error category, Group 4.

misread

Obsolete term for a SPAD error category, Group 3.

Moorgate control

A control by trainstop or equivalent to enforce a low-speed approach to a terminal platform.

motor operated

Power operated by a motor or similar device connected to the signal arm (applicable to semaphore signals). Can also apply to points and detonator placers.

multi-lamp route indicator (MLRI)

An obsolescent term for Standard Alpha-Numerical Route Indicator.

multiple aspect signalling (MAS)

A system of signalling using colour light signals, track circuit block and usually route setting.

multi-section [track circuit]

Alternative term for 'cut-section (track circuit)'.

N**national radio network (NRN)**

A radio telephone system provided specially to facilitate railway operations.

NBDR (NBDR)

A series of positions provided on a lever of a mechanical or power frame for operating points. When operated, the lever can be locked in the Normal, B (normal checklock), D (reverse checklock), Reverse positions respectively. (Other nominated positions are A, C and E.)

no block

A system of operating rail traffic where the condition of the block section is not monitored.

no signaller token (NST)

A system of working trains on a single line using an electric token, in which the signaller gives a release for each token issued. Token instruments at one or both ends of the section may be operated by the train crew.

no signaller token with remote crossing loops (NSTR)

A system of working trains on a single line with the driver or other authorised person responsible for operating the token instruments at one or more locations remote from the signal box, after obtaining verbal permission from the signaller.

non-passable

A signal is designated non-passable because it protects an area of conflict or other infrastructure such that a significant hazard would arise in the event of it being passed at danger without authority. Such signals cannot be passed at danger without specific authority from the signaller, in accordance with the rule book. Non-passable signals are usually controlled signals.

non-safety related

A description applied to those parts of the signalling system whose failure or non-availability does not directly endanger rail traffic or reduce the integrity of the signalling system.

non-vital

An obsolete term for 'non-safety related'.

normal [aspect]

The most restrictive aspect of a controlled signal, or the aspect of an automatic signal which is displayed when no trains are present and no routes set.

normal [function]

Position of a lever or switch when in the un-operated or quiescent state.

normal [points]

The normal position of points is defined by the signalling plan. By convention, points in the normal position are set to give optimum protection to other routes. The normal position of a crossover is to give parallel routes.

normal control

The home and distant signal arms and/or levers are proved at danger and caution respectively before the signaller can give line clear. Also known as 'interlinking'.

normal direction

On a line for which the signalling is provided for one direction only, normal applies to the signalled direction. On a bi-directional line, normal applies to the direction of the predominant traffic flow.

O

occupation

Alternative term for possession.

occupation level crossing

A private level crossing which gives access between premises and a public highway.

OFF [aspect]

A proceed aspect in a colour light signal, or the arm of a semaphore signal or disc signal inclined at 45 degrees or more, or distant signal other than at its most restrictive aspect.

OFF indicator

An indicator that displays the word 'OFF', to indicate that the signal ahead is cleared prior to starting the train, usually associated with a platform starting signal.

offset [of driver's eye]

The horizontal distance between the running edge of the left-hand rail and the centre of the top surface of the driver's seat. (This may be a nominal value, representative of several types of driving cab, or an exact value for a particular class of traction unit.)

offset [of signal or element]

The horizontal distance between the running edge of the left-hand rail and the centre of the signal or element.

ON [aspect]

A red aspect in a colour light signal, or the arm of a semaphore signal in the horizontal position, denoting 'stop' or 'caution', or distant signal at most restrictive aspect.

one control switch (OCS)

A type of route setting control panel having one switch (or other device) to control each route.

one pull [one shot]

Allows the signaller to operate the section signal only once, for each 'line clear'.

one train [release]

Allows the signaller to operate the section signal for one train for each 'line clear'.

one train working

Methods of signalling a single line, where only one train is permitted at a time:

- with a train staff [OT(S)]
- without a train staff [OT].

open crossing (OC)

A level crossing that has no barriers, gates or road traffic signals and is protected only by road traffic signs.

operating notice diagram

A simplified layout plan for publication in, or with, the signalling alterations section of an operating notice, for example WON, PON.

operational use

The manner in which the equipment is used for the purposes of running trains.

operator's control unit (OCU)

The control system for a signaller in a train describer system. It normally consists of a keyboard and VDU or other digital display.

orientation [of close viewing sector]

The angle between the 12:00 (o'clock) position (the direction vertically upward) and a radial line drawn through the centre of the CVS. The angle is measured clockwise from the 12:00 position.

OT (OT)

One Train Working without a Train Staff.

OT[S] (OT(S))

One Train Working with a Train Staff.

out of use

Non-operational equipment that is still connected to the infrastructure.

outline project specification (OPS)

The requirements for a signalling scheme, formulated at the feasibility stage of a project.

overlay track circuit

A track circuit that operates within, and additionally to, another track circuit. Normally used for detecting the passage of a train at or past a specific position.

override

A facility provided in respect to some remote interlockings for use during failure of the remote control equipment. It enables all signals to be replaced to danger or nominated routes to be set for automatic working. Limited selective routing at junctions is sometimes provided. Also known as through routes.

oversetting

The setting of a following movement before the previous movement has cleared the route and/or overlap. Also known as restroking or pumping.

overview

A signalling diagram or display that shows the whole of the area being controlled, usually with reduced detail.

P

parallel bonding

A method of bonding rail sections where track circuit integrity is achieved by the use of parallel paths.

parallel signals

Signals applying to parallel lines signalled in the same direction, that have been placed in the same longitudinal position.

passable

A signal which is able to be passed at danger without specific authority from the signaller, in accordance with the rule book. Passable signals are usually automatic, semi-automatic or intermediate block signals.

patrolman

A person who patrols/inspects a section of line.

patrolman's lockout device (PLOD)

A type of lockout system that allows a patrolman, with the permission of the signaller, to prevent the signalled movement of traffic, for example, in one direction only on a bi-directional line.

performance category

An equipment performance specification based on the distance at which a device is considered readable. Performance categories are defined in GK/RT0031, Table 4. (An objective parameter based on a consensus subjective judgement.)

periodical operating notice (PON)

An operating notice published bi-monthly. This is an official notice giving details of Weekly Operating Notice information, specified operations publications, and other publication changes, for example, of the Sectional Appendix.

permanent speed restriction (PSR)

The normal speed restriction for the operation of trains over a section of line.

permissive block

A form of permissive working through a block section.

phantom aspect

Light emitted from a signal lens assembly that has originated from an external source (usually the sun) and has been internally reflected within the signal head in such a way that the lens assembly gives the appearance of being lit.

phantom overlap (POL)

A calculated full overlap that does not correspond to a physical track section joint. It is used where an overlap distance falls short of a set of points and those points are not locked.

phantom restricted overlap (PROL)

An overlap that contains the special features of a phantom overlap and a restricted overlap.

pilotman

A person who has been appointed to manage the passage of trains over a Single Line during the failure of equipment, during repairs or due to an obstruction.

pivot light

A light that is common to both ON and OFF aspects of a position light signal, or the common lamp of a PLJI where more than one diverging route exists.

platform starting signal

A stop signal located such that either:

- The longest passenger (or empty coaching stock) train authorised to use the platform would, if stopped at the signal, still have a portion of the passenger accommodation alongside the platform, or
- The leading end of the train passes over the AWS equipment associated with the signal before it is despatched from the platform.

plunger

A button that is depressed to activate signalling equipment.

point detector

A device for proving that points are correctly set before a signal can be cleared to authorise passage of a train over the points.

point end

One pair of switch rails in a set of points.

point handle

A collective term for crank handle and pump handle.

point machine

The equipment for the powered operation of a set of points.

point zone telephone

A telephone in the vicinity of one or more points for use by a shunter, other operating staff or maintenance staff to communicate directly with the signaller in connection with the operation of the points.

points

Items of permanent way which may be aligned to one of two positions, normal or reverse, according to the direction of train movement required.

points indicator

An indicator that informs the driver that the associated points (usually facing) are correctly set.

position light ground signal (PLGS)

An alternative term for ground position light (GPL), or independent position light signal.

position light junction indicator (PLJI)

An indicator which displays the route at a signal by means of a line of white lights.

position light signal

A signal, other than a main signal, that displays its aspects by the position and colour of its lights.

positioning

The process of establishing the optimum position of a proposed signal or element.

positive train identification (PTI)

A system that identifies a train directly from equipment on board the train for the purposes of train description, rather than from a train describer.

possession [of a line]

The complete stoppage of all normal train movements on a running line or siding for engineering purposes. Also known as an occupation.

power frame

A lever frame controlling power operated equipment.

power operated points

Points that are operated by any means apart from mechanical.

preliminary caution [aspect]

A signal aspect which informs the driver to expect the next signal to be at caution. It is indicated by a double yellow aspect.

preselection

The selection of a signalling function prior to the condition becoming available, so that it is automatically set when some other function is restored.

pre-set shunt

Where facing shunting signals exist in the line of route of other route classes these will be cleared (generally automatically) before the main (presetting) signal clears.

prevent shunt

The prevent shunt of a track circuit is the value of resistance connected across the rails at which the track circuit relay energises (that is, it just makes its front contacts).

propelling movement

A movement where the driver is not driving from the leading cab of the leading vehicle.

protected wrong side failure

A wrong side failure where another part of the signalling system provides an acceptable level of protection. Also known as a 'low risk failure'.

protecting signal

A signal that protects a train from conflicting movements and/or obstructions.

proved

Evidence provided by electrical or other means that a function is in a specified state.

public emergency telephone system (PETS)

A special telephone system for use at level crossings. It includes provision for proving handset connection.

pull plate

Alternative term for lever (or switch) plate, tablet or badge.

pump handle

A portable handle for the manual operation of a clamp lock or a set of train operated points.

Q

There are no entries under 'Q'

R

radius

The radius of curvature of the track.

rail circuit

Train Detection equipment using the rails in an electric circuit, which detects the presence of a train (as opposed to its absence). Alternative term for track circuit and overlay track circuit.

rail datum mark

A temporary reference line inscribed across the crown of the left-hand rail in exactly the same longitudinal position as the display. Used to assist measurement during positioning or sighting a signal.

railway order

The Railways (Notice of Accidents) Order 1986.

railway safety case

A safety case prepared pursuant to Regulations 3, 4 or 5 of the Railways (Safety Case) Regulations 1993.

Raynes Park control

The name given to ensure that approach control is effective. the relay (or equivalent) that applies the approach control, or Temporary approach control, is proved not operated in the signal in rear.

reaction

The process of the driver taking action in response to seeing the signal.

read [a signal]

The cognitive process involved in the driver's correct interpretation of the display in the context of its surroundings. To correctly identify any possible displayed aspects and indications, when observing the signal under the conditions in which a train driver will view it. A signal can only be read if all the aspects and indications in a particular performance category can be fixated simultaneously.

read [a situation]

The cognitive process involved in the driver's correct interpretation of a situation where more than one signal may be visible. To read a situation the driver must be able to identify and read the applicable signal, whilst being in a suitable position to confidently discount information displayed by any other signals.

read-through [from one signal to another]

A type of misread error made when driving a train. To mistakenly read and react to a signal further away from the train than the next applicable signal.

ready to start indicator

A non-preferred term for right away indicator.

ready to start plunger

A non-preferred term for right away plunger.

rear

Alternative term for 'approach to'.

reciprocal locking

The provision of locking between functions to ensure that conditions cannot be broken down, that is if 1 locks 2, then 2 must lock 1. This form of locking is provided automatically by mechanical interlocking. Also known as 'converse locking'.

red [aspect]

Displayed by a colour light signal, indicates to the driver to stop at that signal.

red/green lights (R/G)

No definition.

red/green lights (R/G)

Alternative term for 'miniature stop lights'.

relay

An electro-mechanical switching device used in many types of signalling systems.

relay interlocking

A method of interlocking where the safety logic is implemented by relay technology.

release

The removal of locking on a function, for example, the removal of route locking or the unlocking of a function such as a ground frame.

release speed

The calculated speed of a train approaching a signal at which the signal is permitted to clear to a less restrictive aspect.

relocatable equipment building (REB)

A walk-in apparatus housing.

reminder appliance

A device or control used to remind the signaller that a function such as a button, switch or lever should not be operated/should only be operated under certain conditions. The formal term for 'collar'.

remotely controlled level crossing (RC)

A level crossing equipped with full barriers that is remotely controlled within normal visual range of the signaller or crossing keeper.

repeater

An alternative term for an indicator (signal box).

repeater signal

A signal (not itself a stop signal) capable of displaying a cautionary aspect, that informs the driver about the state of the next stop signal ahead. Non-preferred term for a distant signal.

replacement [of signals]

The change from a proceed aspect to red when the conditions required by the interlocking aspect level cease to be satisfied. replacement upon a train entering the Route may be delayed (second track and/or last wheel) if required for propelling movements. Also refers to the change of aspect of a distant signal to caution.

replacement switch

A switch or button located in the signal box that enables the signaller to replace an automatic signal to danger. The signal is proved to be at red and alight.

resetting

Placing equipment or systems (for example axle counters) into a state which is suitable for restoration to service.

restoration to service

Accepting reset equipment or systems back into service.

reverse [function]

Position of a lever (or switch) when it is pulled fully in the lever frame (or operated).

reverse [points]

The opposite position to normal (points).

reversible line

Non-preferred term for a bi-directional line.

right away plunger

The plunger or other device used to initiate the operation of a right away indicator.

right side failure

A failure which does not result in the protection provided by the signalling system being reduced. Also known as a negligible risk failure.

road traffic signal

A mandatory stop signal for road traffic, comprising an amber and two flashing red lights.

route class

A category of route which determines the type of signal controls to be provided. For example call-on, main, shunt, warning and POSA.

route holding

An alternative to the term 'route locking'.

route locking

A form of interlocking which maintains the locking associated with a route in use until after the train has passed clear of the equipment being locked (for example, points or opposing signal). The release may be effective only after a time delay. Also known as 'maintained locking' or 'route holding'.

route relay interlocking (RRI)

A relay based interlocking system controlled from a route setting panel. Usually refers to a free-wired interlocking.

route releasing

The release of route locking.

route setting

A system in which all points in a route are set to the required positions, and the signal at the entrance to the route cleared by the operation of one or two control functions.

route setting panel

A panel which embodies the controls and displays the condition of all associated signals for a route in a specific geographic location.

run through

A movement through trailing points set in the wrong position. Damage to the point mechanism and switch rail usually results.

running movement

A train movement on a running line, under the control of a main aspect.

running signal

An alternative term for main signal.

rural barriers

A type of barrier equipment that is designed to be operated locally by the user, typically provided at a user worked crossing.

S

safe

Secure from risk.

safe system of work

Formal method of work devised from taking account of all likely sources of danger to provide for the safety of those involved, affected by, or in the vicinity of the work.

safety case

A document by which an organisation sets out to demonstrate its ability to conduct a particular operation or activity in an acceptably Safe and proper manner. Also applies to the design and use of systems and equipment.

safety related

Having the potential to influence safety (when applied to equipment or systems).

safety review group (SRG)

No definition.

sand drag

A section of line covered in sand or other retarding material on a dead-end line, provided in special instances to retard an overrunning movement. Also known as an arrestor.

scheme plan

A longitudinal scaled or dimensioned track layout plan that is produced to depict new or altered signalling systems.

scotch block

A wedge to prevent the movement of:

- stationary vehicles
- the open Switch Rail of a set of points.

sealed release

An emergency release which requires a seal to be broken prior to operation.

searchlight signal

A colour light signal that can display red, yellow and green aspects from a single optical assembly. Modern forms employ LED or fibre optic technology; heritage types change aspect by placing separate coloured lenses in front of a single lamp.

sectional appendix

A document produced by the infrastructure controller providing route specific information relevant to train operating and trackside staff.

sectional route release

Route Releasing designed to release sequentially, usually one track section at a time behind the train.

secure power supply

A power supply system that can be relied upon to keep certain safety-critical signalling functions operating for a predetermined minimum time, in the event of a total incoming supply failure.

self-restored points

Power operated points which are automatically returned by the interlocking to the normal position to provide protection after a movement via the points reverse. Normalisation occurs after the route has been released and the track section has been clear for a predetermined time. Also known as 'self-normalising points'

semaphore signal

A signal which informs a driver by means of the position of a mechanical arm during daylight and coloured lights during darkness.

semi-automatic signal

A signal normally operated by the passage of trains, but which can also be controlled by a signal box or ground frame. On new projects a controlled signal would be provided.

sequential locking

Locking applied to successive running signals to enforce the replacement of one lever (arm or aspect) before the lever controlling the signal in rear is free to be pulled. This locking is non-reciprocal and may be performed electrically or mechanically.

series bonding

The failsafe method of bonding track circuits with rail sections connected in series, such that a single failure results in the track circuit showing occupied.

set [points]

Refers to the interlocking function which controls the movement of the points to their correct position. Successful completion of the setting process results in correspondence.

setting

The interlocking function controlling the movement of points or other moveable components to the correct position.

showing clear when occupied [track circuit] (SCWO)

No definition.

shunt [route class]

A route used for low-speed non-passenger movements.

shunt-ahead signal

A type of subsidiary signal authorising shunting movements ahead of a section signal.

shunting frame

A manned control point (usually elevated) that can be released by a power signal box for local shunting movements.

shunting movement

The movement of trains or vehicles other than normal passage along running lines.

shut-in

Clear of, and protected from, the running line.

side light

A small aperture at the side of a colour light signal repeating the main aspect and giving a close-up indication.

siding

A line for the stabling of vehicles, loading/unloading, servicing, etc clear of the running lines.

sighting

The process of evaluating the effectiveness of an installed signal or element by means of on-site observation of visibility and readability.

sighting distance [signal]

The distance from a signal to its sighting point.

sighting point [signal]

The furthest point from a signal at which the driver can reliably read the aspect of a signal and / or route indication.

signal box diagram

A diagrammatic representation of the area controlled by the signal box exhibited in the signal box for the guidance of the signaller.

signal identification plate

The plate attached to the signal post for unique identification of the signal.

signal number

The number associated with a signal for identification.

signal OFF indicator

An alternative term for OFF Indicator.

signal passed at danger (SPAD)

Signal Passed At Danger (without authority).

signal post replacement switch

A switch on or near the post of a colour light signal which enables the signal to be turned and maintained at red by means of a key.

signal stick

The disengaging of a signal after it has been used by a train, to prevent the signal from subsequently showing a proceed aspect until the route has been cancelled and again set.

signallers display sub-system (SDS)

The signallers interface with the IECC. The signaller is able to control signalling functions and receive indications through the workstation.

signallers route lists

A list of all point ends and releases between the entrance-exit signals of a signalled route, showing the position to which each is required to be set. Used primarily in degraded mode operation.

signalling controls

Signalling functions that control, release or are released by other signalling functions for a particular layout. Signalling controls are expressed in a control table.

signalling diagram

Non-preferred term for 'signal box diagram'. non-preferred term for 'signalling plan'.

signalling facilities diagram

A plan, produced at an early stage in the development of a project, showing operating requirements and infrastructure features, including the track layout, stations, level crossings. It is used as a basis for producing the scheme plan.

signalling function

A signal, set of points or other part of the train control system.

signalling plan

A longitudinally scaled or dimensioned track layout plan showing the signalling functions with their identities. It generally relates to a specific signal box control area and is a derivative of the scheme plan.

signalling rail

The rail of a single rail Track Circuit that is independent from the traction return path and is used only for the track circuit current.

signalling system

A series of electrical, electronic, electro-mechanical units brought together to form a system which controls the safe movement of trains.

signalling workstation

The generic term used for the signallers display system.

simplified bi-directional signalling (SIMBIDS)

Bi-directional signalling where the signalling in the opposite direction to normal traffic provides for a lower speed and/or capacity than that in the normal direction, and bi-directional operation is only required in connection with possessions or emergencies affecting the other line(s).

single aspect

A colour light signal capable of displaying only one aspect. This may be red (fixed red) or yellow (fixed distant signal).

single line working

Methods of operation introduced so that the traffic of a double line can pass over one line (which is not bi-directional) because of engineering work, equipment failure or an obstruction.

single slip

A combination of a diamond crossing with two point ends without the need of separate crossings (points).

single yellow [aspect]

Displayed by a colour light signal, informs the driver to expect the next main signal to be at danger.

skew crossing

A level crossing where the road crosses the railway at an acute/obtuse angle.

slip connection

The connection which permits movement from one line to another at a diamond crossing. Common types are single slip and double slip.

slotting

The control of a signalling function that requires co-operation between two signal boxes or other controlling points.

snubbing device

Diode or mechanically operated contacts within the points circuitry that are employed to steer the high inductive load currents (snubbing) away from the point motor. This is in addition to the clutch mechanism.

solid state interlocking (SSI)

A first generation processor based system for controlling the interlocking between points and signals, as well as communication with lineside signalling functions.

space [lever frame]

The term used on a mechanical Lever Frame where a lever is removed and the function is no longer in use.

SPAD Error Category Group 1

A type of error resulting in a SPAD involving miscommunication between railway staff.

SPAD Error Category Group 2

A type of error resulting in a SPAD involving the driver failing to locate a signal or failing to react correctly to the observed signal.

SPAD Error Category Group 3

A type of error resulting in a SPAD involving a driver reading an incorrect signal or an incorrect aspect.

SPAD Error Category Group 4

A type of error resulting in a SPAD involving the driver misjudging the train behaviour or environmental conditions.

SPAD Error Category Group 5

A type of error resulting in a SPAD involving other factors.

SPAD Indicator (SPAD I)

A colour light signal head that displays flashing Red over steady Red over flashing Red in the event of an associated signal being passed at danger without authority.

spare lever

In a lever frame, a lever which is not used for the operation of any signalling equipment.

special speed restriction board (SSRB)

A sign incorporating a St. Andrew's Cross provided on the Approach To certain open level crossings, indicating a maximum permitted speed over the crossing.

speed indicator

A trackside sign which marks the beginning of a speed restriction and indicates the permissible speed.

speed of divergence

The speed permitted through the diverging route. Also known as 'turnout speed'.

split detection

The proof and indication of the position of multiple ended sets of points, individually for each point end.

splitting banner repeating signal

A combination of two banner repeating signals provided on the approach to a junction signal due to sighting restrictions.

splitting distant signals

Two adjacent colour light signal heads providing the driver with information about the state of a junction beyond the next signal. The two heads are referred to as the 'main' and 'offset' heads and can incorporate a stop signal.

spring points

Unworked trailing points which return under spring load to the normal position after the passage of a train in the trailing direction. They may be used as catch points.

spur [track circuit]

A section of running rail required to be electrically common to a series bonded rail, but which is not itself series bonded.

St. Andrew's cross

Signs provided on the road approaches to a level crossing for the information of road users and on special speed restriction boards.

St. George's cross

Incorporated in a sign provided on the approach to certain automatic level crossings to inform the driver to regulate the speed of his train in order to observe the restriction of speed which applies from the subsequent special speed restriction board. Also referred to as a 'level crossing warning sign'.

staff and ticket working

A signalling system used on a single line and employing a single token (Train staff). If the driver does not take the train staff through the section, a written ticket is issued to authorise the movement.

stageworks

The phased installation and commissioning of signalling equipment, as part of a large resignalling scheme, often of a temporary nature as alterations proceed.

standard

An authorised document, including specification, procedure, instruction, directive, rule or regulation, which may set mandatory requirements.

standard alphanumeric route indicator (SARI)

An alphanumeric route indicator having medium range (category two) performance. (Formally known as a theatre or multi-lamp type route indicator.)

start against signal SPAD (SAS SPAD)

A signal passed at danger (without authority) upon a train starting from rest, for example from a station platform.

start on yellow SPAD (SOYSPAD)

A signal passed at danger (without authority) subsequent upon a train starting from rest, for example from a station platform, on a yellow aspect.

starting signal

In block signalling, a stop signal beyond, and worked from, a signal box. If no advanced starting signal is provided, it is the section signal.

stencil indicator

A type of miniature alphanumeric route indicator (formerly used in conjunction with shunting signals or for OFF indicators), employing a stencil to form the character(s) to be displayed. An obsolete term.

stick

A term often used to describe a function which stores or remembers specific conditions of the signalling equipment. Also known as a latch in electronic systems.

stock rail

The fixed rail on each side of the points against which the switch rail must fit closely.

stop block

A structure fixed at the termination of a running line or siding to arrest slow-moving vehicles.

stop board

A sign where a driver must stop the train.

stop indicator

An Indicator showing the word 'stop', where the driver must stop the train.

straight-ahead route

The non-diverging (and usually the fastest) route from a junction signal.

stretcher

A bar connecting the two switch rails in a point end, keeping them in the correct position relative to each other.

subsidiary signal

An additional semaphore signal controlling shunting movements and movements onto occupied tracks.

sub-surface railway station

A railway station to which members of the public have access and of which more than 50 % of any one platform is within a tunnel or under a building.

supplementary detector

An additional device for detection of points in association with supplementary drives.

supplementary drive

An additional drive connected to the switch rails of a set of points at a position closer to the crossing than the switch tips. An alternative term for supplementary drive is 'backdrive'.

suppression [AWS or TPWS]

Inhibition of the operation of AWS or TPWS track equipment for movements to which it does not apply.

surface concrete troughing (SCT)

A series of lidded troughs, usually laid in the cess, comprising a cable route.

swamping

Swamping is the effect by which bright sunlight reduces the perceived brightness of a signal's aspects by reducing the contrast between the aspects and the immediate surroundings. This includes the effect of reflections from the exterior surface of the lens assembly.

swinging overlaps

The ability to maintain the overlap free of locking where there are facing points and a choice of overlap exists, thus enabling late selection of the overlap while the train is approaching. Usually associated with 'time of operation locking' and 'conditional locking' requirements.

switch diamond

A type of diamond crossing with movable switches in place of fixed crossings (points). Also known as moveable angles or moveable elbows.

switch rail

The moving portion of rail on each side of a set of points.

system review panel (SRP)

No definition.

T**table of signal routes**

A comprehensive list of signal routes. They can either be shown on, or accompany signalling / scheme plans.

tail cable

A cable between trackside or on-track signalling equipment and the apparatus case / REB.

tail lamp

The red light(s) or blind at the rear of a train to furnish evidence that the train is complete.

tell tale

A breakable wire or plunger arrangement that when broken or operated gives an indication to the signaller and/or replace signals. Also known as a trip wire or hazard detector.

temporary approach control

A signalling control built into the signalling system and applied when it is necessary for drivers to control the speed of their trains due to engineering works or other operational requirements.

temporary block working

A system of controlling rail traffic on a track circuit block line during a failure or in exceptional circumstances. Not applicable to single lines.

terminal platform

A platform that serves a dead-end line.

terminal single line

A dead-end single line terminating at a stop block, stop board or exceptionally at a signal.

terminal station

A station at the end of a line.

termination indicator

A trackside sign denoting the end of a temporary speed restriction.

test magnet

A permanent AWS magnet mounted at the exit from a rolling stock depot.

theatre indicator

An obsolescent term for 'standard alpha-numerical route indicator'.

three aspect signal

A colour light signal capable of displaying three aspects.

three aspect signalling

A system of colour light signalling which normally provides only red, yellow and green aspects. the signals may be two aspect signals, Three aspect signals or a mixture of both types.

through station

A station for mainly non-terminal lines.

throw bar

The part of the point mechanism which provides the thrust for the operation of the switch rails.

tilt authorised

The tilt supervision system provided to authorise the train to tilt within a tilt permitted area. A tilt authority output is generated by TASS. As trains leave tilt permitted areas this authorisation is removed.

tilt permitted

The defined areas of the network where tilting by particular train types is permitted.

time division multiplex

An electronic system used for transmitting a number of data channels over a single pair of wires.

time of operation locking

The locking of facing points immediately beyond an exit signal, when a train is approaching the signal. It is generally the time required to open the detection contacts, unlock, move and lock the points, and close the detection contacts.

time release

A device or control used to prevent the operation of a signalling function until after the lapse of a specified time.

toe

The front end of a switch rail.

token

Any single line token, staff or tablet.

token transfer magazine

A magazine that can be temporarily attached to an electric token instrument to permit tokens to be transferred from one token instrument to another. This enables the transfer of Tokens between instruments without affecting the operational use of the token system.

tokenless block

A method of working single lines without a continuous train detection system or a physical token.

tolerable risk

A term used to indicate the point of maximum tolerability that society is prepared to live with. Risks above this level must be reduced or the activity/project abandoned.

Tollerton control

A timing delay incorporated into the operation of Track Circuits where there is a transition between SSI and RRI track circuited areas, and an incorrect track sequence of circuit clearance could give rise to a hazardous locking release.

track circuit assister interference detector (TCAID)

Train detection equipment mounted on the track which detects the presence of a working track circuit assister.

track circuit interrupter (TCI)

Track-mounted device normally positioned at catch or trap points which maintains a track circuit in its occupied state after the passage of a vehicle which may have been derailed.

track circuit minimum length

The minimum length of a track circuit, which has to be greater than the longest wheelbase of the vehicle required to be detected. Axle counters also require a minimum length of track section for train detection.

track locking

The locking of a signalling function when a track section over the moveable infrastructure concerned is occupied.

tracker ball

A device that enables a signaller to enter data and control points and signals in an IECC.

trackside functional module (TFM)

An electronic module that connects the SSI data link to conventional lineside signalling equipment.

trailable [points]

Point machine made trailable so that a movement in the trailing direction with the points set in the opposite position does not cause damage. (Trailable point machines are more complex than non-trailable and therefore require more maintenance.)

trailing [direction]

The direction of rail traffic over points where the train meets the heel of the switch rail first.

trailing points

Points which join two converging routes.

train describer (TD)

A system that identifies trains (Train description) and displays their location to the signaller.

train description (TD)

A multiple character identifier for each train.

train on line (TOL)

The state of a block section when a train or other obstruction is between the section signal of one signal box and the clearing point of the next signal box.

train operated points

Trailable points which are continuously driven to one position such that facing movements will always pass through them in the same direction. Also known as hydro-pneumatic points.

train operated route release (TORR)

A method of releasing a route after the passage of a train without further action from the signaller.

train ready to start (TRTS)

No definition.

train ready to start (TRTS) indicator

An indicator in the signal box, to indicate to the signaller to clear the platform starting signal.

train ready to start (TRTS) plunger

The means by which station staff inform the signaller that a train is ready to depart.

train services database (TSDB)

No definition.

train staff

A particular type of token.

train wheel detector

Items of equipment that provide the necessary functions to indicate the passage of a train wheel past a particular position on the track.

traincrew operated barriers (TMO(B))

A crossing equipped with barriers (with or without road traffic signals) and operated by the guard or nominated person.

traincrew operated crossing (TMO)

A crossing equipped with barriers or gates (with or without road traffic signals) and operated by the guard or nominated person.

trainstop

A trackside device which may be controlled to initiate an emergency brake application on any train passing it.

transponder

Equipment normally fixed on or near the track which passes information electronically to a passing train.

trap points

Facing points provided at an exit from a siding or converging line to de-rail an unauthorised movement, thus protecting the adjacent running line.

treadle

A mechanical or electrically operated device to detect the presence or passage of a train at a specific position.

Trainstop System (TSS)

Trainstop System as applied by TPWS.

tunnel signal

A signal which, if at danger, would cause a train to stop wholly or partially within a tunnel.

turnout

A point end (excluding switch diamonds).

turnout speed

The speed permitted through the facing points when set for the diverging route.

two aspect signal

A colour light signal capable of displaying two aspects.

two aspect signalling

A system of colour light signalling normally employing red/green two aspect stop signals only (as commonly used on London Underground). Yellow/green repeater signals are only provided when required by inadequate sighting of the stop signals.

U

under road crossing (URX)

A buried service route passing underneath the road carriageway, for example at a level crossing.

undertrack crossing (UTX)

A buried service route passing under the tracks below the level of the underside of the sleepers or track slab. This excludes services laid through a bridge span or roadway.

unprotected wrong side failure

A wrong side failure where no other part of the signalling system provides protection. Also known as a high risk failure.

Unreadable [signal or element]

A signal or element not considered readable. A signal or element may become unreadable in specific circumstances, for example at a particular distance from the signal, or in certain ambient lighting conditions.

unworked points

Points (usually hand points) not controlled from a signal box or ground frame.

upper quadrant

A term applied to a semaphore signal, whose clear position is designated by the arm above the horizontal.

user worked crossing (UWC)

Level crossing protected by gates or barriers, operated by the user. It may be equipped with a telephone and/or red/Green lights.

V

vehicle overhang

The distance measured parallel to the rail from the centre of the outermost wheel on a vehicle to the nearest extreme end of the vehicle.

versine

Mathematically: $\text{Versine}(\theta) = (1 - \cos \theta)$. In colloquial use the 'versine' on a curved portion of track is the extent to which the track turns sideways through the curve - the transverse displacement (offset). $v = r \text{Versine}(\theta)$, where 'r' is the radius of curvature and 'θ' the change in direction. 'v' is used in the calculation of the additional structural clearance on curves.

vertical half-beam angle [of light emitted from signal or element]

The angle between the beam centre-line and the line that represents 50% of the peak intensity, measured at the surface of the element in the vertical plane containing the centre-line.

view [of a signal or element]

The extent to which the signal or element is visible.

viewing [a signal, signal or element]

To fixate a signal or element, but without necessarily being in a position at which all or any of the display is visible or readable.

viewing angle [of an aspect or element]

The angle, in three-dimensional space, between the centre-line of the beam and the driver's line of sight.

visible [of signal or element]

A signal or element, which when viewed from a particular point meets the minimum criteria for visibility.

visual acuity

The ability to resolve fine detail. Normally tested by recording the smallest size letters at a defined distance.

visual display unit (VDU)

A screen on which various types of information is displayed.

vital

Equipment whose correct operation is essential to the integrity of the signalling system. Most vital equipment is designed to fail-safe principles - a wrong side failure of vital equipment could directly endanger rail traffic.

W

warning [route class]

A route from one main signal to the next main signal with a restricted overlap, where the full or reduced overlap is not available or not required. The entrance signal is approach controlled.

warning board

A board on the approach to a temporary or emergency speed restriction ahead, placed at a distance before commencement to provide adequate braking distance.

warning indicator (WI)

A board on the approach to a permanent speed restriction ahead, placed at a distance before commencement to provide adequate braking distances. A non-preferred term for warning indicator is advance warning indicator.

Welwyn control

In absolute block, it prevents the signaller from accepting a second train without the first having occupied and cleared the home signal berth track circuit.

whistle board

A sign to inform the driver to sound the horn.

wicket gate [level crossing]

A small gate, which may be controlled from a signal box or gate box, used to regulate the passage of pedestrians over a railway line.

wicket gate lever

A lever which, when pulled, locks the wicket gate(s) closed. Not interlocked with the signalling.

wide to gauge points

A point end where the two switch rails are not connected by stretchers. there are two ways in which this can be applied:

- Trap points where the two switch rails move in opposite directions - both open in the normal position; both closed in the reverse position. Used where it is required that a derailed train keeps closely to the track alignment.
- a point end forming part of two crossovers, where each switch rail is operated by a separate point machine.

wig-wag

Colloquial term for road traffic signals.

wrong direction

Opposite to the normal direction of rail traffic on a particular line. Also known as contra-flow when applied to a bi-directional line.

wrong side failure

A failure that results in the protection provided by the signalling system being reduced or removed.

X

There are no entries under 'X'

Y

yellow shunt signal

A type of shunting signal which applies only to movements in the direction(s) to which the signal can be cleared, other movements being able to pass the signal without it being cleared. Can also be a ground position light signal using yellow lights.

yodalarm

Proprietary term for a level crossing audible alarm.

Z

There are no entries under 'Z'