

Resetting and Restoration to Service of Signalling Systems

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Synopsis:

This standard sets out requirements for the Resetting and Restoration to service of signalling systems where this could create a hazard.

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Resetting and Restoration to Service of Signalling Systems

Railway Group Standard

GK/RT 0027

Issue Two

Date June 1998

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Part A

Issue record This standard will be updated when necessary by distribution of a complete replacement.

Amended or additional parts of revised pages will be marked by a vertical black line in the adjacent margin.

Issue	Date	Comments
1	Oct. 1995	New standard.
2	June 1998	Supersedes Issue 1

Responsibilities Railway Group Standards are mandatory on all members of the Railway Group* and apply to all relevant activities which fall within the scope of each individual's Railway Safety Case. If any of those activities are performed by a contractor, the contractor's obligation in respect of Railway Group Standards is determined by the terms of the contract between the respective parties. Where the contractor is himself a duty holder of a Railway Safety Case then Railway Group Standards apply directly to the activities described in his Railway Safety Case.

*The Railway Group comprises Railtrack and the duty holders of Railway Safety Cases accepted by Railtrack

Compliance Issue 2 of this standard does not introduce any new requirements over and above those contained in Issue 1. Compliance is therefore mandatory from 1st August 1998. Retrospective action to bring existing systems into compliance should already be complete and retrospective action to bring any remaining non compliant systems into compliance is therefore mandatory except where it can be demonstrated that such retrospective action fails to meet the test of reasonable practicability.

Health and Safety Responsibilities In authorising this standard, Railtrack PLC makes no warranties, express or implied, that compliance with all or any of Railway Group Standards is sufficient on its own to ensure safe systems of work or operation. Each user is reminded of its own responsibilities to ensure health and safety at work and its individual duties under health and safety legislation.

Supply Controlled and uncontrolled copies of this standard must be obtained from the Catalogue Secretary, Railtrack Safety & Standards Directorate, Floor 1, Railtrack House, Euston Square, London NW1 2EE.

Telephone: 085 78774 or 0171 557 8774 (BT)
Facsimile: 085 79072 or 0171 557 9072 (BT)

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Part B

1 Purpose To define the requirements to control the risk of an unsafe condition arising from the resetting and restoration to service of signalling systems.

2 Scope This standard shall apply to existing or proposed systems where the process of resetting and restoration to service may create a hazard. The Appendix gives examples of systems and activities to which the standard typically does or does not apply

It shall apply at initialisation and to resetting and restoration to service following failure, incorrect operating sequence, maintenance disconnection, or changeover between alternative systems. It does not apply to one-shot release of facilities during degraded working.

It applies to both manual and automatic processes.

This standard covers the general requirements for the production of system specific resetting and restoration to service procedures and instructions.

3 Definitions **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.

Initialisation – Work associated with bringing new or altered equipment into service.

Correspond[ence] – Where the state of the equipment or system is the same as the state of the railway.

Disconnection – A deliberate act to isolate a piece of equipment from the remainder of the signalling system in order to prevent it influencing the signalling system.

Engineer – The contractor or other person appointed by Railtrack to be responsible for maintenance of the signalling infrastructure.

Failure – Failure of the Equipment or System to operate correctly and correspond to the state of the railway.

Incorrect Operating Sequence – Any situation where the equipment or system is designed to complete a defined cycle or sequence of operations, but, due to unplanned or irregular movements, or the failure of a movement to take place, the cycle or sequence cannot be completed.

Resetting – Placing equipment or systems into a state which is suitable for restoration to service. (Note – In the context of this standard resetting is described as a step towards restoration to service. The Engineer may however reset for other reasons, such as fault finding and testing).

Restoration to Service – Accepting reset equipment or systems back into service.

4 Requirements

4.1 General

Railtrack shall ensure that procedures are available for safe resetting and restoration to service of all signalling systems.

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This standard shall be applied to ensure that the risks and procedures are assessed and recorded for each stage in the resetting and restoration to service process. This shall form the basis for detailed specific system requirements, which in turn may require procedures or instructions to be produced.

The Procedures or Instructions for resetting and restoration to service at any site shall be capable of implementation with the communications available and shall be designed to minimise the risk of misunderstanding.

For new equipment or systems resetting and restoration to service procedures shall be contained within the supporting manual and must be presented at the time of system approval.

4.2 Failure or Maintenance Disconnection Mode

A full understanding of the state of the failure and the effect of any disconnection is an essential part of minimising the risks that could arise during resetting and restoration to service. There may be many possible conditions producing failures with different effects on the operation of the signalling.

A documented analysis of credible failure modes and effects shall be carried out and the procedures and instructions for specific equipment and systems shall take account of the following factors;—

- (a) The method of operation of the system.
- (b) All known failure and disconnection modes, and their effects.
- (c) The possibility of intermittent or partial failure.
- (d) Operational failure due to an incomplete or irregular sequence of events in the operation of traffic.
- (e) The risks associated with each identified failure or disconnection mode.

4.3 Protection Arrangements

For each identified mode of failure or disconnection, the protection arrangements shall be identified. Protection arrangements shall be adequate, taking into account the interaction of the failed or disconnected system with other parts of the signalling system.

Protection shall remain effective during the failure, throughout resetting, and until restoration to service takes place.

Systems shall normally be designed to incorporate a specific means of isolating them from the signalling system while they are being worked upon. Where such a means of isolation is not provided adequate procedures shall be prepared and implemented to ensure safety.

Automatic protection facilities shall be used where these are available. However, procedures and instructions shall ensure that such protection has taken effect and remains effective until restoration to service.

Where the protection arrangements include action by the Engineer at the request of the Signaller, procedures and instructions shall specify how these actions are requested, confirmed and recorded.

4.4 Indications

Procedures and instructions shall take account of the indications provided to the Signaller and Engineer to identify;—

- a) where these assist in the safe operation and/or protection of the line; or
- b) where they may be inoperative, incorrect, or misleading during the period of failure or disconnection.

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4.5 Resetting

Automatic resetting shall only be permitted if the equipment or system is fully self checking for correspondence with the state of the railway. Where self-checking is by means of a device external to the failed system, the risk of error in the checking process shall be shown to be tolerable.

In all other cases, a specific action shall be required by the Engineer. This action shall not affect the protection arrangements. Procedures and instructions shall specify the form of communication with the signaller and any records required.

4.6 Restoration to Service

Procedures and instructions shall identify where:—

(a) Restoration to service is fully automatic following resetting. The removal of any protection arrangements and any special working arrangements for the resumption of normal traffic shall be specified; or

(b) Restoration to service requires specific action by the Signaller following resetting [eg; the operation of a specific device]. Indications to be observed before, during and after restoration to service shall be specified; or

(c) Restoration to service requires the Signaller to request the Engineer to take specific action, or where co-operative action is required by both Signaller and Engineer. The method of communication, confirmation of actions, checks and records required shall be specified.

4.7 Records

The procedures and instructions for the processes required by this standard shall identify the record creation and retention system. These records shall be retained to facilitate the analysis of any incident that occurred in, at least, the previous 24 hours of operations and for such longer period as may be necessary to satisfy any auditing requirements.

Records may be kept in the form of signed Train Register entries, Occurrence/Log Book entries, special forms, or electronic data recording, but must show date and time of failure or disconnection, and date and time of resetting and restoration to service, together with the names or identities of the Signaller and Engineer(s) involved.

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Appendix

Application of this standard

This Appendix gives illustrative examples of the application of the standard and thus is not exhaustive. It gives examples of the 'systems' to which the standard is applicable and examples of activities which are not applicable, together with the reasoning. The reasoning is grouped by category as follows:

- Category A Significant risks apply to the resetting and restoration to service following failure, etc. These risks are controlled by applying the requirements of this standard.
- Category B1 Significant risks apply to the resetting and restoration to service following failure, etc. These risks are controlled by the documented process(es) referred to in the remarks column.
- Category B2 Significant risks apply to the resetting and restoration to service following failure, etc. These risks are controlled by process(es) and protocols built into the system. (Typically this category covers modern data based systems).
- Category C No safety risk exists or the safety risks do not require to be addressed by this standard. Refer to the remarks column for further explanation.

System	Category	Remarks
Axle Counters	A	(GK/RC0527 applies)
OTW without staff	A	
Tokenless Block	A	
Interlocked Absolute Block	A	
Keyless lockout systems including PLOD	A	
Absolute Block	B1	Covered by Rule Book and Train Signalling Regulations
Absolute Block (Use of Welwyn facility)	B1	Welwyn used to clear cancelled trains, not system failures
Points	B1	Covered by GK/RT0231 requirements
650V Signalling Power Supply	C	Not a safety system
SSI Initiation	B2	SSI protocols provide protection
SSI Emergency Signals On Control	B2	SSI protocols provide protection
SSI datalinks	B2	SSI protocols provide protection
Tokens	B1	Covered by Rule Book and Electric Token Block Regulations
Electronic Tokens	B2	System protocol provides protection (refer to GK/RT0054)
'Signalling system' after planned works or (all types) of maintenance	B2	Sub-elements to be considered individually
Latched relays	C	Covered by GK/RT0231 requirements

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Giving Rule Book Section E releases	C	Covered by GK/RH0750 requirements
Red dome nuts	C	Too low level in system, refer to GK/RT0231
HABDs	C	Not a system for train control

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References

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| GK/RC0527 | Axle Counters :Code of Practice for Resetting and Restoring to Service |
| GK/RH0750 | Signalling Maintenance Specifications |
| GK/RT0054 | Radio Electronic Token Block |
| GK/RT0231 | Signalling Maintenance Testing |