



Rail Safety & Standards Board

Published by

**Rail Safety and Standards Board
Evergreen House
160 Euston Road
London NW1 2DX**

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GK/GN0612

Guidance on Signalling Lockout Systems to Protect Railway Undertaking Personnel

Issue One: August 2007
Railway Group Guidance for GK/RT0212



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Guidance on Signalling Lockout Systems to Protect Railway Undertaking Personnel

Issue Record

Issue	Date	Comments
One	August 2007	Original document

Superseded documents

This Railway Group Guidance Note does not supersede any other Railway Group documents.

Supply

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Guidance on Signalling Lockout Systems to Protect Railway Undertaking Personnel

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Guidance on Signalling Lockout Systems to Protect Railway Undertaking Personnel

Part 1 Introduction

1.1 Purpose and structure of this document

This document has been published by Rail Safety and Standards Board to give guidance on how to control the hazards that arise when signalling lockout systems are used to protect railway undertaking personnel who work on or near the line, in particular:

- a) Guidance on the technical requirements in Railway Group Standard GK/RT0212 Signalling Lockout Systems to Protect Railway Undertaking Personnel
- b) Guidance on the related technical and operational requirements contained in other Railway Group Standards: GE/RT8000, GE/RT8048, GI/RT7006, GK/RT0011, GK/RT0025, GK/RT0060 and GK/RT0206
- c) Recommending the technical and operational features that should be included within infrastructure manager safety management systems
- d) Recommending the operational features that should be included within railway undertaking safety management systems.

The specific requirements in the standards listed above are not reproduced in full because it would be detrimental to the clarity of this Guidance Note.

Specific responsibilities and compliance requirements are laid down in the Railway Group Standards.

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1.3 Approval and authorisation of this document

The content of this document was approved by:

CCS Standards Committee on 15 February 2007

This document was authorised by RSSB on 7 March 2007

Guidance on Signalling Lockout Systems to Protect Railway Undertaking Personnel

Part 2 Guidance on signalling lockout systems to protect railway undertaking personnel

2.1 Hazards that need to be managed when railway undertaking personnel work on or near the line

2.1.1 Provision of signalling lockout systems

- 2.1.1.1 A range of methods, including signalling lockout systems, are used by the infrastructure manager to protect personnel who carry out duties on or near the line, in order to comply with GE/RT8000 (the Rule Book).
- 2.1.1.2 Where signalling lockout systems are used to protect its own personnel, the infrastructure manager is solely responsible for establishing the technical and operational requirements that provide for safe working within its safety management system.
- 2.1.1.3 In some circumstances, railway undertakings require their personnel to go on or near the line to carry out routine work, typically: servicing of stationary rolling stock within station areas or sidings. In such cases, a railway undertaking may, as part of its safety management system, decide to make arrangements with the infrastructure manager to provide facilities for staff protection in the form of a signalling lockout system. The decision to carry out such work on or near the line should be justified by the railway undertaking to demonstrate that risk has been reduced to ALARP.
- 2.1.1.4 Where facilities are provided by the infrastructure manager, the railway undertaking relies upon the safety integrity of the signalling lockout system to establish a safe system of work for its own personnel and specifies its use within its own safety management system.
- 2.1.1.5 The technical and operational interfaces between the infrastructure manager and railway undertaking are within the scope of Railway Group Standards. It is also necessary to align the safety management systems of the infrastructure manager and railway undertaking at the duty-holder interface to ensure that all of the hazards are sufficiently controlled. The interfaces associated with a typical lockout system are shown in Appendix B.
- 2.1.1.6 The primary function of signalling lockout systems, used by railway undertakings, is to prevent the issue of signalled movement authorities for all train movements into, out of, or within a pre-defined protection area. The protection provided by signalling lockout systems is dependent upon the safe control of train movements within the limits of signalled movement authorities and the safe actions of drivers, signallers and users.
- 2.1.1.7 The particular signalling lockout system requirements set out in GK/RT0212 provide for the transfer of an authority to use protection between the infrastructure manager and railway undertaking in the form of a physical key. All of the safety requirements contained in this Guidance Note should be put in place to ensure that a key can only be transferred from one duty-holder to the other (in either direction) when it is safe to do so.
- 2.1.1.8 Because signalling lockout systems cannot provide protection from un-signalled train movements (for example, during degraded railway operations and engineering possessions), or unauthorised train movements (for example, a SPAD), additional arrangements should also be put in place to address these scenarios.

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2.1.2 The system level hazard

- 2.1.2.1 The system level hazard when railway undertaking personnel work on or near the line is: 'lines are open to traffic while the railway undertaking personnel are on or near the line'.
- 2.1.2.2 The system level hazard is present when the sub-system safety requirements have been violated (pre-conditions, post-conditions and invariants) during all railway operational conditions, whenever railway undertaking personnel work on or near the line. The operational conditions that should be considered include:
 - a) Normal railway operations provided for by the signalling system
 - b) Abnormal railway operations, for example, wrong direction signalled moves
 - c) Degraded railway operations, for example, hand-signalled train movements
 - d) Emergency conditions, for example, unauthorised or uncontrolled movements.
- 2.1.2.3 The particular arrangements put in place for signalling lockout systems should be designed and operated to control the system level hazard during normal railway operations and those abnormal railway operations that are provided for in the signalling system.
- 2.1.2.4 Additional methods of staff protection should also be established to control the system level hazard during degraded railway operations and emergency conditions. This may include operational rules that prohibit the use of signalling lockout systems when un-signalled movement authorities are taking place, and emergency warning arrangements.
- 2.1.2.5 Movement authorities that are totally under the control of a railway undertaking, such as movements under the direction of shunters, should be addressed as part of the railway undertaking safety management system.

2.1.3 Particular hazards associated with signalling lockout systems

- 2.1.3.1 A number of hazards arise at the duty-holder boundary between the infrastructure manager and the railway undertakings as a consequence of implementing and operating signalling lockout systems. These hazards can be described as boundary hazards.
- 2.1.3.2 Failure to control all of the boundary hazards would mean that the system level hazard would not be controlled.
- 2.1.3.3 Analysis of signalling lockout systems used by railway undertakings has identified a set of requirements that, if implemented, mitigate the risk arising at the duty-holder interface. The complete set of requirements is presented as a system interface specification (see Appendix A), which addresses:
 - a) Technical requirements and operational rules applicable to the infrastructure manager (pre-conditions and post-conditions)
 - b) Operational rules applicable to the railway undertaking (pre-conditions and post-conditions)
 - c) Technical requirements and operational rules at the duty-holder interface (invariant requirements that are applicable to both the infrastructure manager and railway undertakings).

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- 2.1.3.4 The technical requirements and operational rules at the duty-holder interface (see clause 2.1.3.3c) above) are provided for by complying with the Railway Group Standards, but these are insufficient on their own to control the system level hazard. Each of the boundary hazards can only be mitigated when the infrastructure manager and railway undertakings establish safety management systems that are compatible with each other and also provide for compliance with Railway Group Standards. This Guidance Note provides guidance on what should be included in the safety management systems to ensure compatibility.
- 2.1.3.5 The technical and operational requirements applicable to infrastructure manager safety management systems, including guidance on compliance with Railway Group Standards, are set out in section 2.2.
- 2.1.3.6 The operational requirements applicable to railway undertaking safety management systems are set out in section 2.2.

2.2 Guidance on signalling lockout system requirements

2.2.1 Provision of signage, labelling and operating instructions

- 2.2.1.1 The first boundary hazard associated with signalling lockout systems is: 'Complete or partial loss of "legibility" of the lockout system identification'.
- 2.2.1.2 GE/RT8000 (the Rule Book) requires the person responsible for setting up a safe system of work to ensure it is adequate. Inadequate or degraded signalling lockout system signage and labelling could result in a user misinterpreting the scope of protection provided by a system, which could lead the user to set up inadequate protection arrangements.

Guidance for infrastructure managers and railway undertakings

- 2.2.1.3 Each signalling lockout system should be designed and configured by the infrastructure manager to meet the operational requirements of the railway undertaking. The scope of protection provided by each signalling lockout system should be agreed between the infrastructure manager and the railway undertaking and be included in a system design specification. The following items should be considered:
- a) The geographical limits that need to be protected
 - b) The types of activity that take place under the protection
 - c) The number of people and separate work groups that use the system
 - d) The times of day that the system is used
 - e) The access arrangements to and from the protection area
 - f) The methods of communication between the user and the signaller
 - g) The movement authorities that are prohibited when the protection is established
 - h) The lines adjacent to the protection area and the movements that can still take place when the protection is established.

Guidance for infrastructure managers

- 2.2.1.4 The infrastructure manager should produce and implement a set of system operating instructions to provide for the safe operation of each signalling lockout system. The operating instructions should be compatible with the requirements in GE/RT8000 (the Rule Book) and set out the co-ordinated sequence of operations that need to be carried out by the signaller and the user.

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2.2.1.5 The instructions should set out:

- a) The sequence of operations required when:
 - i) Protection is established
 - ii) Protection is used
 - iii) Protection is given up
- b) The identity and permitted scope of use of the signalling lockout system.

2.2.1.6 The particular content in the instructions should include the guidance contained in sub-sections 2.2.1 to 2.2.6.

2.2.1.7 The instructions should be agreed with, and made available to, the railway undertaking before the signalling lockout system is taken into operational use. The arrangements for publishing local instructions are set out in GE/RT8004.

2.2.1.8 The infrastructure manager should ensure that:

- a) Every signalling lockout system is provided with 'fit for purpose' signage that is compliant with GK/RT0212 sub-section 2.1.1
- b) Operational signalling lockout systems are maintained as part of an asset management system to ensure that signage is legible to the user whenever the system needs to be operated
- c) Arrangements are put in place to ensure that permission to use signalling lockout systems is withheld when signs are missing or illegible, until corrective action has been completed
- d) Signallers are competent to operate signalling lockout systems.

Guidance for railway undertakings

2.2.1.9 Railway undertakings should ensure that:

- a) Personnel who use signalling lockout systems understand, and have access to, signalling lockout system operating instructions
- b) Signalling lockout systems are only used to provide protection for the scope of work for which they have been specified in accordance with the system operating instructions
- c) Personnel who use signalling lockout systems are competent and understand that the protection afforded by the particular lockout system is compatible with the work that needs to be protected
- d) Personnel report any difficulty in reading the signage or interpreting the scope of protection provided by the signalling lockout system, in accordance with the requirements for reporting failures set out in GE/RT8000 (the Rule Book)
- e) Personnel do not use defective lockout systems.

2.2.2 Signalling control and display system

2.2.2.1 The second boundary hazard associated with signalling lockout systems is: 'Safety related failure of the signalling system could result in a signaller setting a route (resulting in the issue of a movement authority to a train) into an area for which a release has already been given by a signalling lockout system'.

2.2.2.2 There is a possibility that, under certain signalling failure conditions, an incorrect movement authority could be issued to a train that would result in a violation of the protection provided by a signalling lockout system.