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Guidance on ERTMS/ETCS National Values
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Guidance on ERTMS/ETCS National Values

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Superseded documents

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

Supply

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Guidance on ERTMS/ETCS National Values

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Guidance on ERTMS/ETCS National Values

Part 1 Introduction

1.1 Purpose of this document

- 1.1.1 This document gives guidance on interpreting the requirements of Railway Group Standard GE/RT8408 issue one 'ERTMS/ETCS National Values'. It does not constitute a recommended method of meeting any set of mandatory requirements.
- 1.1.2 All requirements in GE/RT8408 are reproduced in the sections that follow. Guidance is provided as a series of sequentially numbered clauses prefixed 'GN' immediately below the boxed text to which it relates. Where there is no guidance given, this is stated.
- 1.1.3 Specific responsibilities and compliance requirements are laid down in the Railway Group Standard itself.

1.2 Scope

- 1.2.1 Subset-026 identifies a number of ERTMS/ETCS National Values that can be varied to fit specific safety and operational performance objectives. These ERTMS/ETCS National Values cover many aspects of ERTMS/ETCS operation, including, for example, the maximum speeds permitted under different modes of operation.
- 1.2.2 GE/RT8270 requires railway undertakings and infrastructure managers to maintain, update and make freely available to relevant parties the available data that describes asset characteristics relevant to compatibility.
- 1.2.3 The set of values of ERTMS/ETCS National Values, determined in accordance with the process set out in GE/RT8408, describe asset characteristics that are relevant to compatibility.
- 1.2.4 The ERTMS/ETCS National Values set comprises the following:
 - a) Q_NVDRIVER_ADHES – Qualifier for the modification of trackside adhesion factor by driver.
 - b) V_NVSHUNT – Shunting mode (permitted) speed limit.
 - c) V_NVSTFF – Staff Responsible mode (permitted) speed limit.
 - d) V_NVONSIGHT – On Sight mode (permitted) speed limit.
 - e) V_NVUNFIT – Unfitted mode (permitted) speed limit.
 - f) V_NVREL – Release Speed (permitted) speed limit.
 - g) D_NVROLL – Roll away distance limit.
 - h) Q_NVSRBKTRG – Permission to use service brake when braking to a target is supervised.
 - i) Q_NVEMRRLS – Qualifier Emergency Brake Release.
 - j) V_NVALLOWOVTRP – Maximum speed limit allowing the driver to select the 'override EOA' function.
 - k) V_NVSUPOVTRP – Permitted speed limit to be supervised when the 'override EOA' function is active.
 - l) D_NVOVTRP – Maximum distance for overriding the train trip.
 - m) T_NVOVTRP – Maximum time for overriding the train trip.

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- n) M_NVDERUN – Entry of Driver ID permitted while running.
 - o) T_NVCONTACT – Maximal time without new 'safe' message.
 - p) M_NVCONTACT – Onboard reaction when T_NVCONTACT expires.
 - q) D_NVPOTRP – Maximum distance for reversing in Post Trip mode.
 - r) D_NVSTFF – Maximum distance for running in Staff Responsible mode.
- 1.2.5 The titles of ERTMS/ETCS National Values: V_NVSHUNT, V_NVSTFF, V_NVONSIGHT, V_NVUNFIT and V_NVREL include the term 'permitted'. However, these ERTMS/ETCS National Values are used for the maximum supervised speed which is not necessarily the permitted speed. It is expected that later versions of Subset-026 will not include the word 'permitted' in the title of these ERTMS/ETCS National Values.
- 1.2.6 With a limited operational experience during the early stages of the ERTMS/ETCS rollout, GE/RT8408 does not identify specific values to be applied to the ERTMS/ETCS National Values for Great Britain (GB) application.
- 1.2.7 Details on all of the above ERTMS/ETCS National Values are set out in Appendix A.
- 1.2.8 The ERTMS/ETCS National Values are those set out in Baseline 2, Subset-026 and Subset-108. The versions cited in legislation for Subset-026 and Subset-108 at the time of publication of GE/RT8408 are v2.3.0 and v1.2.0 respectively, but later versions are known to exist. The combination of Subset-026 v2.3.0 and Subset-108 v1.2.0 are commonly referred to as ERTMS/ETCS system version 2.3.0d.

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1.4 Approval and authorisation of this document

- 1.4.1 The content of this document was approved by Control Command and Signalling (CCS) Standards Committee on 15 December 2011.
- 1.4.2 This document was authorised by RSSB on 27 January 2012.

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Part 2 Guidance on ERTMS/ETCS National Values

2.1 Process to determine or revise a set of ERTMS/ETCS National Values

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| 2.1.1 | For a National Area under their responsibility, the infrastructure manager shall propose a set of values of ERTMS/ETCS National Values, including the rationale for the determination of each value. |
| 2.1.2 | There shall be a single value for each ERTMS/ETCS National Value within a National Area. |

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| GN1 | NID_C defines a National Area. To create additional sets of ERTMS/ETCS National Values it is necessary to create a new National Area (that is to say, a new NID_C). The requirements for obtaining a new value of NID_C are set out in GE/RT8072. |
| GN2 | Values of NID_C are not unlimited. When determining the values of the set of the ERTMS/ETCS National Values, if the set has the same values as of other National Areas which are under the responsibility of the same infrastructure manager, consideration should be given to extending the National Area, instead of creating a new National Area. National Areas do not necessarily have to be conterminous. |
| GN3 | When determining the values of the set of the ERTMS/ETCS National Values, infrastructure managers should consider the values with regard to safety, cost and performance. Appendix A of this document gives guidance on determining the values. |
| GN4 | Complexity in operational rules and the risk of ETCS intervention can be reduced if values allocated to a ERTMS/ETCS National Value are the same in bordering National Areas. |
| GN5 | Changes to the values of an ERTMS/ETCS National Value are required to be managed by the process set out in GE/RT8408, so that a consistent set is applied across a whole National Area. The process controls the impact of the determination of values, as these can affect safety and performance for infrastructure managers and railway undertakings. It is not possible therefore to have more than one value for an ERTMS/ETCS National Value in a National Area and to meet the requirements of this process. |

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| 2.1.3 | The infrastructure manager proposing a set of values of ERTMS/ETCS National Values shall consult with all affected infrastructure managers and railway undertakings about the proposed values. |
| 2.1.4 | Affected infrastructure managers and railway undertakings shall evaluate the impact of the proposed values on their operations and indicate their acceptance or otherwise, with explanation as required. |
| 2.1.5 | The infrastructure manager proposing a set of values of ERTMS/ETCS National Values shall determine an optimal set of values for a National Area based on the lowest overall risk to safety and performance, taking into consideration the responses from the affected infrastructure managers and railway undertakings. |

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| GN6 | Governance arrangements constituted under the cross-industry National ERTMS Programme, for example the ERTMS System Body, should be used by the infrastructure manager proposing a set of values to reach agreement with affected infrastructure managers and railway undertakings. |
| GN7 | Affected infrastructure managers include those that have National Areas that border the National Area for which the set of values is being proposed and can include those that have similar sets of values established for other National Areas. |

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| GN8 | Affected railway undertakings include those that have track access agreements for the National Area. |
| GN9 | Some ERTMS/ETCS National Values continue to have an effect on ERTMS/ETCS fitted trains in areas that are not fitted with ERTMS/ETCS. Normally, when operating in lines not fitted with ERTMS/ETCS, ERTMS/ETCS fitted trains will use the last set of ERTMS/ETCS National Values received. Affected infrastructure managers and railway undertakings should take this into account when a new set of ERTMS/ETCS National Values is proposed. |
| GN10 | Appendix A gives guidance to affected infrastructure managers and railway undertakings of the possible impact of the proposed values on their operations. |

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Part 3 Application of this document

3.1 Application - infrastructure managers

3.1.1 Scope

- 3.1.1.1 The requirements of Part 2 (section 2.1.4) of this document apply to all infrastructure managers.
- 3.1.1.2 The requirements of Part 2 (sections 2.1.1, 2.1.2, 2.1.3 and 2.1.5) of this document apply to infrastructure managers proposing a set of ERTMS/ETCS National Values.

3.1.2 Exclusions from scope

- 3.1.2.1 There are no exclusions from the scope specified in 3.1.1 for infrastructure managers.

3.1.3 General compliance date for infrastructure managers

- 3.1.3.1 This Railway Group Standard comes into force and is to be complied with from 01 December 2012.
- 3.1.3.2 After the compliance dates or the date by which compliance is achieved if earlier, infrastructure managers are to maintain compliance with the requirements set out in this Railway Group Standard. Where it is considered not reasonably practicable to comply with the requirements, authorisation not to comply should be sought in accordance with the Railway Group Standards Code.

3.1.4 Exceptions to general compliance date

- 3.1.4.1 There are no exceptions to the general compliance date specified in 3.1.3 for infrastructure managers.

3.2 Application - railway undertakings

3.2.1 Scope

- 3.2.1.1 The requirement of Part 2 (section 2.1.4) of this document applies to railway undertakings.

3.2.2 Exclusions from scope

- 3.2.2.1 There are no exclusions from the scope specified in 3.2.1 for railway undertakings.

3.2.3 General compliance date for railway undertakings

- 3.2.3.1 This Railway Group Standard comes into force and is to be complied with from 01 December 2012.
- 3.2.3.2 After the compliance dates or the date by which compliance is achieved if earlier, railway undertakings are to maintain compliance with the requirements set out in this Railway Group Standard. Where it is considered not reasonably practicable to comply with the requirements, authorisation not to comply should be sought in accordance with the Railway Group Standards Code.

3.2.4 Exceptions to general compliance date

- 3.2.4.1 There are no exceptions to the general compliance date specified in 3.2.3 for railway undertakings.

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3.3 Health and safety responsibilities

- 3.3.1 Users of documents published by RSSB are reminded of the need to consider their own responsibilities to ensure health and safety at work and their own duties under health and safety legislation. RSSB does not warrant that compliance with all or any documents published by RSSB is sufficient in itself to ensure safe systems of work or operation or to satisfy such responsibilities or duties.

GN11 No guidance is associated with Part 3.

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Appendix A Guidance on the determination of values for ERTMS/ETCS National Values

A.1 Introduction

- A.1.1 In 2003 and 2004, RSSB facilitated research project T093 on behalf of the National ERTMS Programme. This project comprised two main phases that are relevant to GE/RT8408.
- A.1.2 The objectives of Phase 1 (Identification of ERTMS/ETCS Parameters) were to establish the appropriate parameter set, to develop a qualitative understanding of how the value of these identified parameters impacts upon system performance and procurement costs, and to propose an approach to establish the optimum value for each.
- A.1.3 The objectives of Phase 2 (Recommendations for National Values) of the study were to develop and use engineering arguments to make recommendations for the values of the subset of the parameters identified in Phase 1 as being amenable to resolution in this way. A further objective was to establish the impact that the recommended values would have on the set of UK standards.
- A.1.4 The project reported on 31 March 2004 and made recommendations for ERTMS/ETCS National Values that have formed the basis of the Cambrian ERTMS Early Deployment Scheme and the information in this appendix.
- A.1.5 The original recommendations in the T093 report have been developed using knowledge, including that gained from the application of ERTMS in Great Britain, greater understanding of the ERTMS specifications, and experience from other applications of ERTMS worldwide.
- A.1.6 This appendix provides general guidance. For application in a specific National Area, consideration should be given to the characteristics of the particular area when determining the suitability of any individual value.
- A.1.7 The ERTMS/ETCS National Values are presented in this appendix in the order in which they appear in section A.3.2 'List of National / Default Data' in Subset-026. Where it is logical to do so, some of the ERTMS/ETCS National Values have been grouped in this document.
- A.1.8 Subset-026 includes a minimum value, a maximum value, a default value and a value resolution. Values can range from the minimum to the maximum value (inclusive) in increments set by the resolution. In some cases, specific values are defined (for example 'not allowed' or 'infinity').
- A.1.9 Default values are only used if ERTMS/ETCS National Values are not available or there is a mismatch between the values onboard and the country or region identifier (NID_C) read from a balise group when compared to the corresponding identifier stored onboard.
- A.1.10 The set of ERTMS/ETCS National Values is stored by the ERTMS/ETCS onboard equipment, even when the ERTMS/ETCS onboard equipment is switched off (NP), and re-used when powered on.
- A.1.11 When assessing the impact of values on driving behaviour, railway undertakings will need to consider the information presented on the driver machine interface. Where relevant, this document assumes a driver machine interface at least broadly compliant with DD CLC/TS50459 or ERA_ERTMS_015560.
- A.1.12 For information, the ERTMS/ETCS National Values used on the Cambrian ERTMS Early Deployment Scheme are listed in Appendix B.

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A.2 Q_NVDRIVER_ADHES

A.2.1 Summary

Name	Q_NVDRIVER_ADHES – Qualifier for the modification of trackside adhesion factor by driver
Subset-026 Minimum value	0 – Not allowed
Subset-026 Maximum value	1 – Allowed
Subset-026 Default value	Not allowed
Resolution	Either 0 or 1
Used in modes	UN, SR, OS, FS, SH and RV
Used in levels	Levels 0, 1, 2 and 3

Table 1 Q_NVDRIVER_ADHES

A.2.1.1 The onboard braking model can be modified to take into account low adhesion by extending the calculated braking distance based on 70% effectiveness of brakes, either:

- a) As commanded by trackside.
- b) As selected by the driver (if permitted).

A.2.1.2 Q_NVDRIVER_ADHES specifies whether the driver is allowed to modify the adhesion factor that is used by the ERTMS/ETCS onboard equipment. Irrespective of the Q_NVDRIVER_ADHES value, the trackside can command the ERTMS/ETCS onboard equipment to modify the adhesion factor (as set out in Subset-026 and GE/GN8605).

A.2.2 Safety considerations

A.2.2.1 ERTMS/ETCS can be configured to increase the calculated braking distance in low adhesion areas. Whether this functionality is used or not, is outside the scope of this document. If this functionality is used, it is possible to allow the driver to select the adhesion factor to either increase the calculated braking distance or revert to the normal braking distance.

A.2.2.2 The safety considerations associated with general use of the low adhesion setting are common to selection by trackside and selection by the driver and are out of scope of this document.

A.2.3 Performance considerations

A.2.3.1 There are two issues relevant to driver selection of this function: disregard, that is to say, the driver fails to select the low adhesion setting when required to do so, and confusion, that is to say, the driver believes that the low adhesion function is active and relies upon it when it is not active.

A.2.3.2 Using an adhesion factor of 70% rather than 100% has the effect of extending the braking distance calculated by the ERTMS/ETCS onboard equipment, which increases journey times; hence increases headway times and, therefore, reduces the line capacity.

A.2.4 Discussion

A.2.4.1 In practice, adhesion varies widely across the infrastructure with both location and time. This variation is significant, even in areas where the adhesion is acknowledged to be low. Thus, within an area of low adhesion, small pockets of very low adhesion are sometimes encountered. In severe cases, the use of an adhesion factor of 70% might not provide sufficient confidence that a train can stop safely according to its movement authority when braking. The general issue of the ability of drivers to stop in poor adhesion conditions, and the decision to use this national variable should consider the potential change to driving policy, to ensure that the current risk is not increased under ERTMS/ETCS (including importing risk into non-ERTM/ETCS areas due to behaviour in ERTMS/ETCS areas).