

Rail Industry Standard
RIS-0784-CCS
Issue: One
Date: March 2017

The Management of Packet 44 Applications

Synopsis

This document sets out requirements on the management of packet 44 of the European Train Control System (ETCS) data protocol for national applications.

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Published by RSSB

Rail Industry Standard
RIS-0784-CCS
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Date: March 2017

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Issue Record

Issue	Date	Comments
One	4/03/2017	<p>This document sets out requirements on the management of packet 44 of the ETCS data protocol for the GB mainline railway.</p> <p>The document replaces GERT8064 issue one. The key changes that have been included in this RIS are:</p> <ul style="list-style-type: none">• The process for the introduction of a new packet 44 application has been amended to use a proposal for change to the RIS process.• Requirements that duplicate the ETCS Baseline 3 documents have been removed.

This document will be updated when necessary by distribution of a complete replacement.

Superseded Documents

The following Railway Group Standard is superseded, either in whole or in part as indicated:

Superseded documents	Sections superseded	Date when sections are superseded
GERT8064 issue one European Train Control System: The Management of Packet 44	All	04/03/2017

GERT8064 issue one European Train Control System: The Management of Packet 44, ceases to be in force and is withdrawn as of 04 March 2017 .

Supply

The authoritative version of this document is available at www.rssb.co.uk/railway-group-standards. Enquiries on this document can be forwarded to enquirydesk@rssb.co.uk.

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Part 1 Purpose and Introduction

1.1 Purpose

1.1.1 This document is a standard on the management of packet 44 of the European Train Control System (ETCS) data protocol, for members of RSSB to use if they so choose.

1.1.2 This document sets out requirements on the management of packet 44 applications when NID_XUSER is set to 9; that is, the value of NID_XUSER assigned to RSSB by the European Union Agency for Railways (EUAR).

1.1.3 Where NID_XUSER is not set to 9, new NID_XUSER numbers can be obtained following the process set out in RIS-8072-CCS.

1.2 Background

1.2.1 Packet 44 applications

1.2.1.1 The ETCS provides communication channels between trackside and onboard equipment. These channels are subject to the requirements of the European Union's interoperability directives. As other systems also require communication channels, a facility has been included in the ETCS to pass messages other than those required by the ETCS.

1.2.1.2 Packet 44 is defined as the means of transmitting data for national applications between train and track and vice versa, using the data transmission facilities included within the ETCS. Such data are identified by being contained in the data packets which include packet identifier (NID_PACKET) 44.

1.2.1.3 Within each packet 44, there is an identifier (NID_XUSER) which is defined in Subset-054 as 'this variable uniquely defines the identity number of a specific user system for which the remainder of packet 44 is intended'. Subset-054 also states that 'a user may use his value of NID_XUSER for more than one purpose as long as he organises his data inside packet 44 in a way that adequately distinguishes between them'.

1.2.1.4 The value of NID_XUSER is allocated by the EUAR in its role as system authority for ERTMS, in accordance with Subset-054. For the Great Britain (GB) mainline railway, the request of new allocation of NID_XUSER is through the ERTMS National Identities Coordinator, as set out in RIS-8072-CCS.

1.2.1.5 Section 3.4 of ERA_ERTMS_040001 shows that the value of NID_XUSER allocated to RSSB (formerly Railway Safety) is 9.

1.2.2 ETCS language

1.2.2.1 The ETCS language is used in transmitting information over the Euroradio, Eurobalise and Euroloop airgaps. The ETCS language is composed of messages, telegrams, packets and variables, and is described in chapters 7 and 8 of Subset-026.

1.2.2.2 A message includes user data and protocol data. The protocol data are dependent on the transmission medium.

1.2.2.3 Where the form of transmission is by Eurobalise, the message can be composed of one or more telegrams, one from each successive Eurobalise. The format of the telegram transmitted by each Eurobalise is shown in Figure 1 *Eurobalise telegram structure* on page 6:

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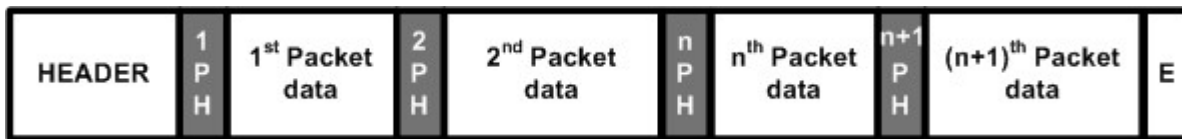


Figure 1: Eurobalise telegram structure

Note: 1. n = n^{th} packet sequence within the message comprised of its header (PH) and its data.

Note: 2. E = the end of information identifier, packet 255.

1.2.2.4 A Euroloop message is equivalent to that of a balise telegram with a header, data packets and an end of information packet, but the message does not need to be constructed from multiple telegrams.

1.2.2.5 A Euroradio message contains one header and predefined set of variables (if needed) and data packets.

1.2.2.6 Details of the rules for these messages are set out in section 8.4 of Subset-026.

1.2.3 Packets and variables

1.2.3.1 Packets are multiple variables grouped into a single unit, with a defined internal structure consisting of a packet header followed by packet data. A list of defined packets and their descriptions and data structure is set out in 7.4 of Subset-026.

1.3 Application of this document

1.3.1 A member of RSSB may choose to adopt all or part of this document through internal procedures or contract conditions. Where this is the case the member of RSSB will specify the nature and extent of application.

1.3.2 Therefore compliance requirements and dates have not been specified since these will be the subject of internal procedures or contract conditions.

1.3.3 The Standards Manual and the Railway Group Standards (RGS) Code do not currently provide a formal process for deviating from a Rail Industry Standard (RIS). However, a member of RSSB, having adopted a RIS and wishing to deviate from its requirements, may request a Standards Committee to provide opinions and comments on their proposed alternative to the requirement in the RIS. Requests for opinions and comments should be submitted to RSSB by e-mail to proposals.deviation@rssb.co.uk. When formulating a request, consideration should be given to the advice set out in the 'Guidance to applicants and members of Standards Committee on deviation applications', available from RSSB's website.

1.4 Health and safety responsibilities

1.4.1 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.

1.5 Structure of this document

1.5.1 This document sets out a series of requirements that are sequentially numbered.

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1.5.2 This document also sets out the rationale for the requirement. The rationale explains why the requirement is needed and its purpose. Rationale clauses are prefixed by the letter 'G'.

1.5.3 Where relevant, guidance supporting the requirement is also set out in this document by a series of sequentially numbered clauses and is identified by the letter 'G'.

1.6 Approval and Authorisation

1.6.1 The content of this document was approved by the Control Command and Signalling Standards Committee (CCS SC) on 19 January 2017.

1.6.2 This document was authorised by RSSB on 31 January 2017.

Part 2 Requirements for the Management of Packet 44 Applications

2.1 The structure of GB packet 44

2.1.1 Data structure

2.1.1.1 When NID_PACKET equals 44 and NID_XUSER equals 9, the content of the packet shall be:

Variable	Length (BITS)	Comment
NID_PACKET	8	Identifies packet 44.
Q_DIR (for track to train communication only)	2	Identifies the direction of movement for which the packet is valid.
L_PACKET	13	Total length of packet, including header (number of bits).
NID_XUSER	9	Identifies RSSB as custodian of the packet.
NID_UKSYS	8	Identifies the UK applications.
NID_UKSYS2	8	Same function as NID_UKSYS, but only present if NID_UKSYS = 255.
NID_UKSYSn	8	Same function as NID_UKSYS, but only present if NID_UKSYS(n-1) = 255.
T_UKSTART	8	Indicates that the contents of the current packet are not to be used before T_UKSTART.
T_UKSTART2	8	Same function as T_UKSTART, but only present if T_UKSTART = 255.
T_UKSTARTn	8	Same function as T_UKSTART, but only present if T_UKSTART(n-1) = 255.
T_UKFINISH	8	Indicates that the contents of the current packet are not to be used after T_UKFINISH.
T_UKFINISH2	8	Same function as T_UKFINISH, but only present if T_UKFINISH = 255.
T_UKFINISHn	8	Same function as T_UKFINISH, but only present if T_UKFINISH(n-1) = 255.
	Variable	Other data, as specified by NID_UKSYS.

Rationale

G 2.1.1.2 The definition of the GB data structure when NID_XUSER equals 9 facilitates the management of packet 44 applications to support compatibility and potential future use of existing applications.

Guidance

G 2.1.1.3 This data structure conforms to Subset-026. The packet structure for packet number 44 for track to train and for train to track is set out in section 7.4.2.11 and 7.4.3.6 of Subset-026 respectively.

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G 2.1.1.4 The definitions for NID_PACKET, Q_DIR, L_PACKET and NID_XUSER are set out in section 7.5 of Subset-026.

G 2.1.1.5 The definitions for NID_UKSYS, T_UKSTART and T_UKFINISH are set out in sections [2.1.2 NID_UKSYS, NID_UKSYS2 to NID_UKSYSn](#) on page 9 and [2.1.3 Packet validity data T_UKSTART, T_UKSTART2 to T_UKSTARTn and T_UKFINISH, T_UKFINISH2 to T_UKFINISHn](#) on page 9 of this document.

2.1.2 NID_UKSYS, NID_UKSYS2 to NID_UKSYSn

2.1.2.1 The definition of NID_UKSYS shall be:

Name	Identity of a specific UK p44 application		
Description			
Length of variable	Minimum value	Maximum value	Resolution / formula
8 bits	0	254	Numbers
Special / reserved values	0	Not used	
	1-254	Identifies UK applications	
	255	Indicates that a further 8-bit application identifier follows	

Rationale

G 2.1.2.2 NID_UKSYS identifies specific packet 44 applications for use in the UK. The value 255 is used to indicate that a further 8-bit application identifier follows. In this case, NID_UKSYS2 follows, and so on through to NID_UKSYSn. This parameter is defined in this manner so that it is unlikely to be the limiting factor on the number of applications.

Guidance

G 2.1.2.3 The values allocated to NID_UKSYS at the date of publication are set out in Appendix [A.1 NID_UKSYS Allocations](#) on page 19. The specification of the packets and variables concerned for each application are to be provided in the appendices that follow Appendix [A.1 NID_UKSYS Allocations](#) on page 19, one appendix for each application.

G 2.1.2.4 The process for how to apply for a new value of NID_UKSYS and changes, including new users, to existing allocated applications is set out in [2.2 Management of packet 44 applications](#) on page 12 of this document.

2.1.3 Packet validity data T_UKSTART, T_UKSTART2 to T_UKSTARTn and T_UKFINISH, T_UKFINISH2 to T_UKFINISHn

2.1.3.1 The definition of T_UKSTART shall be as follows:

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Name	Validity start date and time code		
Descriptions	The contents of the current packet are not to be used before T_UKSTART, which represents a date including time		
Length of variable	Minimum value	Maximum value	Resolution / formula
8 bits	0	255	Numbers
Special / reserved values	0	The packet and its data are in service unless T_UKFINISH has become valid. When both T_UKSTART and T_UKFINISH equal 0, no changes shall be pending and the packet and its data are valid	
	1-254	Indicates the start date and time for successive versions of the data	
	255	The value overflows to the next byte	

2.1.3.2 The definition of T_UKFINISH shall be as follows:

Name	Validity finish date and time code		
Descriptions	The contents of the current packet are not to be used after T_UKFINISH, which represents a date including time		
Length of variable	Minimum value	Maximum value	Resolution / formula
8 bits	0	255	Numbers
Special / reserved values	0	The packet and its data are out-of-service unless T_UKSTART has become valid. When both T_UKSTART and T_UKFINISH equal 0, no changes shall be pending and the packet and its data are valid	
	1-254	Indicates the end date and time for successive versions of the data	
	255	The value overflows to the next byte	

Rationale

G 2.1.3.3 The use of T_UKSTART and T_UKFINISH allows data changeovers to be pre-programmed in correspondence to date codes. This allows a data changeover date to be amended without the need to re-programme balises or reinstall on-train data.

Guidance

G 2.1.3.4 These parameters represent a date code, not a real date and time. Each consecutive value of the variable indicates the next occasion on which the relevant version of data started to be valid. For example, in the case of track-to-train transmission, new data in balises include the date code for the end of validity of the previous data and the start of validity of the new data. When the new data are due to take effect, the onboard equipment, being programmed with the corresponding function, rejects the previous date code and accepts the new date code.

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G 2.1.3.5 The finish and start date functions, and the necessary complementary software, if needed, are implemented through the onboard equipment (interpreting transmissions from the track to the train), or trackside equipment (interpreting transmissions from the train to the track).

G 2.1.3.6 It is permissible for the specific meaning assigned to the values of these parameters to be defined by the user.

2.1.4 ETCS variable and packet 44 applications

2.1.4.1 Where a packet 44 application requires a variable that is already specified for the purposes of ETCS, and its specification is also that required for the packet 44 application, then the ETCS variable shall be proposed, unless justification for an alternative packet 44 variable is provided.

Rationale

G 2.1.4.2 This is to support consistency between applications and to prevent potential use of incompatible values of variables of the same meaning, but generated independently.

Guidance

G 2.1.4.3 In circumstances where an alternative packet variable is unavoidable, justification is to be included with the application for a new NID_UKSYS number, as set out in [2.2.2 Proposing a new packet 44 application](#) on page 12.

G 2.1.4.4 Reasons to adopt an alternative packet 44 variable include, but are not limited to, differences in the variable attributes (for example bit structure, dynamic range and resolution).

G 2.1.4.5 When alternative parameters are proposed, it is important that measures to mitigate the risk of incompatible values are documented.

2.1.5 ETCS packet and packet 44 applications

2.1.5.1 Where an application includes a packet that is already specified for the purposes of ETCS, and its specification is also that required for the packet 44 application, then the ETCS packet shall be proposed, unless justification for an alternative packet is provided.

Rationale

G 2.1.5.2 This is to support consistency between applications and to prevent potential use of incompatible packets of the same meaning, but generated independently.

Guidance

G 2.1.5.3 In circumstances where an alternative packet is unavoidable, justification is to be included with the application, as set out in [2.2.2 Proposing a new packet 44 application](#) on page 12.

G 2.1.5.4 Reasons to adopt an alternative packet include, but are not limited to: (1) the facilitation of the management of the packet through its life cycle; (2) the provision of additional functionality or application where needed.

G 2.1.5.5 When alternative packets are proposed, it is important that measures to mitigate the risk of incompatible values are documented.

2.2 Management of packet 44 applications

2.2.1 Allocated values of NID_UKSYSn

2.2.1.1 Only allocated values of NID_UKSYS, as set out in Appendix A to this RIS, and the associated data protocols shall be used.

Rationale

G 2.2.1.2 Only using allocated NID_UKSYS values and associated data protocols allows potential future use of existing applications.

Guidance

G 2.2.1.3 The re-use of existing applications provides benefits including:

- a) The prevention of the proliferation of bespoke applications that provide the same functionality which result in repeating the installation and transmission of the same data.
- b) The optimisation of the use of the limited available data and message capacity.
- c) The reduction in the time and effort required to design a bespoke application.

G 2.2.1.4 The values allocated at the date of publication are set out in Appendix [A.1 NID_UKSYS Allocations](#) on page 19. It is intended that the specification of the packets and variables for each application will be included in the appendices that follow Appendix [A.1 NID_UKSYS Allocations](#) on page 19, one appendix for each application.

G 2.2.1.5 Later revisions for allocated NID_UKSYS numbers and associated protocols can be obtained from RSSB, as may be the case, during the period when any new allocation is pending publication.

2.2.2 Proposing a new packet 44 application

2.2.2.1 A proposal for allocating a new NID_UKSYS number shall be submitted, in accordance with the Standards Manual.

2.2.2.2 The proposal shall include the following:

- a) Identities of user organisation(s), details of applicable train types and operating routes.
- b) Outline description of system functionality, including why the application is required and what the packet and its associated variables are used for.
- c) Justification for issue of a new protocol, if an application performing the same function exists.
- d) Description of version management of the packet 44 data protocol.
- e) Data structure and values, which include:
 - i) The packet(s) proposed to provide the functions.
 - ii) The packet structures.
 - iii) The specification of each variable within the packet(s).
 - iv) Justifications for alternative variables or packet(s), if used, where specifications for the same variable or packet already exist for the purpose of ETCS.
- f) Design principles and implementation rules that support why the data are required and how they are utilised.

Rationale

G 2.2.2.3 This is a recognised industry process for managing changes to the content of a Rail Industry Standard (RIS).

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G 2.2.2.4 The details of the application are included to support the management of packet 44 applications.

G 2.2.2.5 Details of the packet structure, variables and specific values are needed to help any potential future use of existing applications.

G 2.2.2.6 The version of each packet 44 data protocol needs to be managed so that the successive versions are identifiable. This helps to prevent incompatible values being used when changes are made to the protocol.

G 2.2.2.7 When an application performing the same function already exists, a new NID_UKSYS number is only assigned where the need for a new protocol is justified.

G 2.2.2.8 Details of design principles and implementation rules relating to why and how the data are implemented are essential to facilitate the correct re-use of existing applications.

Guidance

G 2.2.2.9 The ownership of a packet 44 application resides with the owner of the application. Potential new users can approach the owner for specific details, if not already available, that are necessary for a new implementation. Owners are encouraged to share the information to avoid unnecessary diversity in application.

G 2.2.2.10 When designing a new function, consider whether requirements for any potential future applications (for example other rolling stock types or other routes) can be met, so that the same function could be future proof.

G 2.2.2.11 Co-ordinations and cross-industry discussions are encouraged, especially for functions that are expected to be widely applicable.

G 2.2.2.12 The application can include one or more packets to provide the functions.

G 2.2.2.13 The process for proposing a new packet 44 application is shown in Figure 2 [Proposing a new allocation of a NID_UKSYS](#) on page 14, with the key steps shown in the left column. More details of how to change a standard can be found at the RSSB website.

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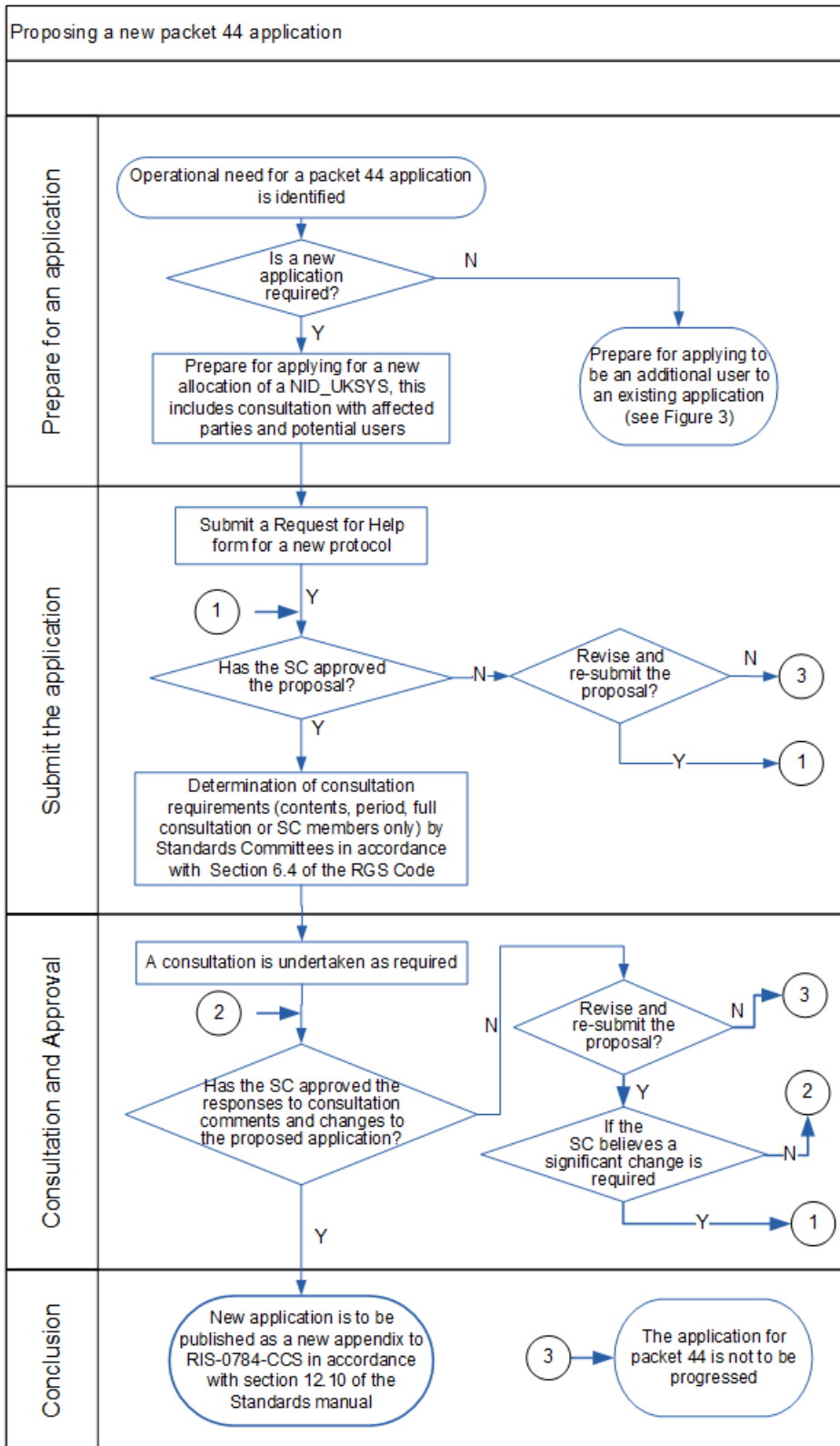


Figure 2: Proposing a new allocation of a NID_UKSYS

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Guidance on how to prepare for an application

G 2.2.2.14 When an operational need for a packet 44 application arises, the first step is to check whether it is possible to make use of an existing application. If an existing application can be used, follow the steps set out in Figure 3 *Proposing a change to an existing application* on page 17.

G 2.2.2.15 The applicant is encouraged to engage with potential stakeholders at the early stage of the development process so that any potential issues can be identified and resolved before the proposal is submitted. This could also support the applicant in identifying and considering the needs of potential future users to improve the re-usability of the application.

G 2.2.2.16 An informal industry consultation with affected parties and potential users could be arranged through RSSB, if required.

Guidance on how to submit the application

G 2.2.2.17 If a new application is considered to be justified, the procedure for change to a RIS, as set out in section 14 of the Standards Manual, needs to be applied.

G 2.2.2.18 The first step of this process, in accordance with the 'How to change standards' page at the RSSB website, is to complete a 'Request for Help' form. A link to the application form and details of where to submit the form are provided at the web page.

G 2.2.2.19 The completed form is submitted to the lead standards committee (SC), for consideration. The procedure for consultation is set out in sections 6.5 and 6.6 of the Railway Group Standards Code.

Guidance on consultation and approval

G 2.2.2.20 If the lead SC approves the proposal, an industry-wide consultation is undertaken in accordance with sections 6.5 and 6.6 of the Standards Manual.

G 2.2.2.21 The consultation process provides the opportunity for industry to advise any commonality with existing and future applications of packet 44, and whether there are safety or functional implications for the applications in use.

G 2.2.2.22 Any responses to consultation comments are approved by the relevant SC before being published and sent to those parties who commented on the proposed change.

Guidance on conclusion of an application

G 2.2.2.23 After SC approval, the new packet 44 application is published as an additional appendix to this standard.

2.2.3 Format of packets and variables

2.2.3.1 Specifications of packet 44 packets and variables shall be written in the format used in Subset-026.

2.2.3.2 The packet 44 variables shall be named in accordance with section 7.3.2.11 of Subset-026.

Rationale

G 2.2.3.3 This is to support the consistency of formatting.

Guidance

G 2.2.3.4 None.

2.2.4 Changes to existing applications

2.2.4.1 A proposal shall be submitted, in accordance with the Standards Manual, for changes to packet 44 protocols, and associated applications that have an impact on existing users or potential future use.

Rationale

G 2.2.4.2 This is a recognised industry process for managing changes to the content of a Rail Industry Standard (RIS).

G 2.2.4.3 Changes that have an impact on existing users or potential future use need to be reflected in the document, to avoid incompatibility and support re-usability of the associated application.

Guidance

G 2.2.4.4 Changes that could have an impact on existing users and potential future use include adding an additional user, and amendment(s) to reserved values. The process for change to a RIS is set out in section 14 of the Standards Manual.

G 2.2.4.5 For other minor clarification changes, a proposal for change is not required. The process for amendment and clarification is set out in section 15.2 of the Standards Manual.

G 2.2.4.6 The process for proposing a change to an existing packet 44 application is shown in Figure [3 Proposing a change to an existing application](#) on page 17, with the key steps showing on the left column. More details of how to change a standard can be found on the RSSB website.

G 2.2.4.7 An assessment of the impact of change is needed to accompany the proposal. In some circumstances, a new allocation of NID_UKSYS could be needed depending on the outcome of the assessment.

G 2.2.4.8 Prior consultation with affected parties reduces the risk of the proposal being challenged at the industry consultation stage.

G 2.2.4.9 Similar to the process for proposing a new application, the first submission for the change is the 'Request for Help' form, in accordance with the 'How to change standards' page on the RSSB website.

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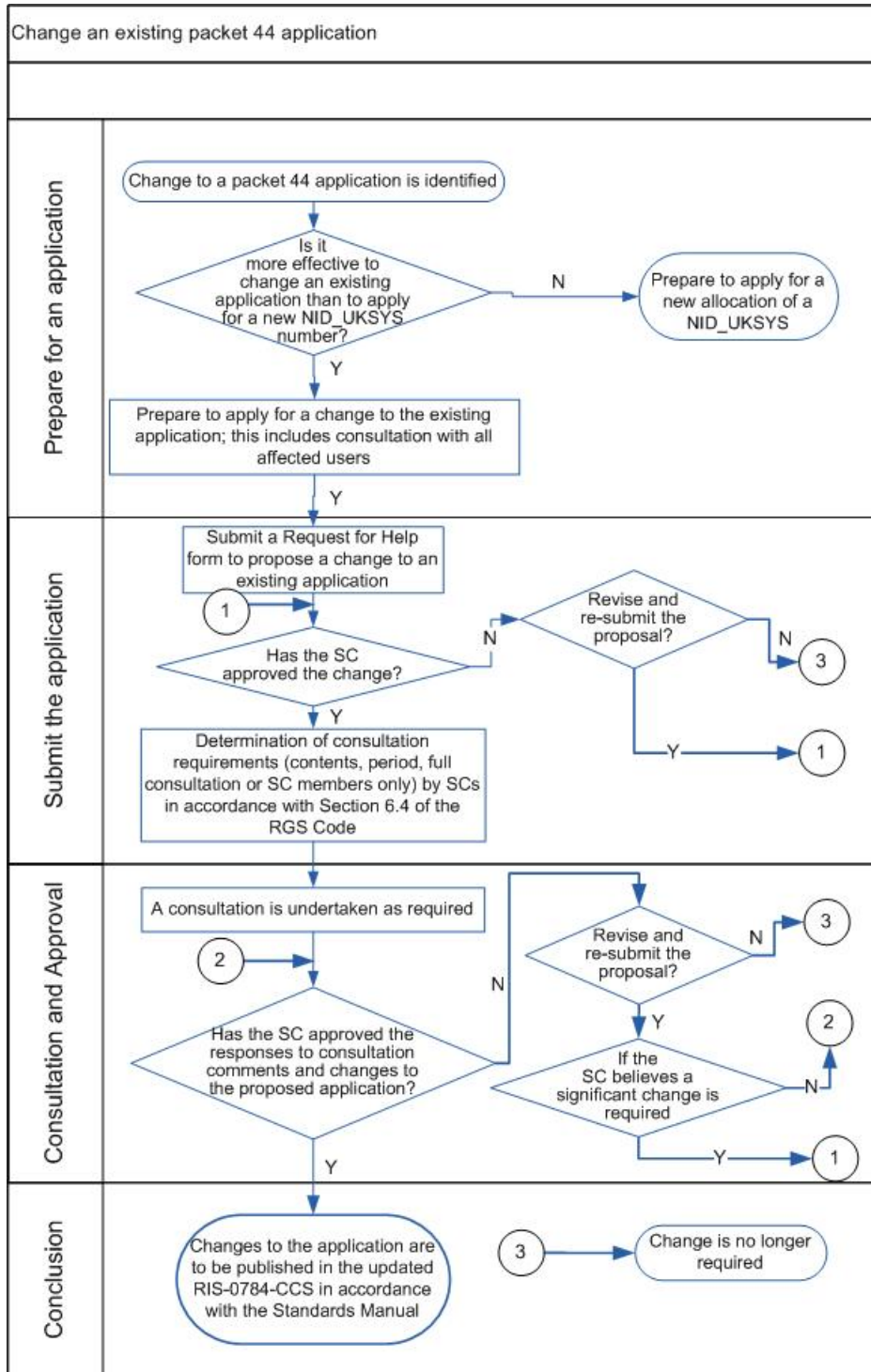


Figure 3: Proposing a change to an existing application

2.2.5 Decommissioning

2.2.5.1 A proposal shall be submitted for the decommissioning of a use of packet 44.

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Rationale

G 2.2.5.2 This is a recognised industry process for managing changes to the content of a Rail Industry Standard (RIS).

G 2.2.5.3 This supports the whole life management of packet 44 applications.

Guidance

G 2.2.5.4 Prior consultation with affected parties reduces the risk of the proposal being challenged at the industry consultation stage.

G 2.2.5.5 The table for the use of NID_UKSYS and associated details are updated after the proposal is approved by the relevant SCs.

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Appendices

Appendix A NID_UKSYS Allocations

A.1 NID_UKSYS Allocations

A.1.1 The table below sets out details of the values allocated to NID_UKSYS at the date of publication.

Name	Identity of Specific UK Application		
Descriptions			
Length of variable	Minimum value	Maximum value	Resolution / formula
8 bits	0	254	Numbers
Special / reserved values	0	Not used	
	1	TASS Management data	
	2	TASS Tilt Authority data	
	3	TASS Speed Supervision data	
	4-5	Not used (see A.1.4 on page 19 and A.1.5 on page 19)	
	6	TASS Selective Door Operation (SDO) data	
	7	Automatic Train Supervision (ATS) data	
	8	Change of Traction System	
	9	FASDO / CSDE Door Control	
	10	Automatic Train Operation (ATO) data	
	11	Train speed units override	
	12	Automatic Power Change-Over, sub-packet that repeats packet 39	
	13	Automatic Power Change-Over, sub-packet that provides specific qualifiers	
	14-254	Not allocated at the date of publication	
255	Indicates that a further 8-bit application identifier follows. This indicator has not been used.		

A.1.2 It is intended to update this table when later applications are approved. Consult RSSB for versions that are in the process of change proposal application or are pending for publication.

A.1.3 The detailed specification of the packet and variables concerned for each packet 44 application is to be provided in the appendices that follow, one appendix for each application.

A.1.4 Appendix B of issue one of GERT8064 shows that the value 4 of NID_UKSYS was allocated to TPWS-E. The application has not been implemented to-date.

A.1.5 It is also specified in C80056/SPEC/SYS/00357 TASS SDO Balise Telegram Specification that values 4 and 5 are not used, to avoid potential ambiguity in using the existing TASS software where 4 and 5 are parsed as identifications of two sub-packets for TASS.

A.1.6 This table sets out packet 44 applications under NID_XUSER 9. There are other packet 44 implementations in GB that are under a different NID_XUSER number; for example, Siemens Trainguard CBTC system has been implemented in the central area of Crossrail using NID_XUSER 15. All the allocated NID_XUSER values and associated design authorities can be found in section 3.4 of ERA_ERTMS_040001.

Appendix B Train speed units override (NID_UKSYS=11)

NID_UKSYS value	11
Date of allocation	01/08/2015
Owner	Network Rail
Identity of users	All RUs running ETCS fitted rolling stock in GB
Type of train	All classes of ETCS fitted rolling stock in GB
Geographical area	National
Transmission	Eurobalise or RBC from track to train

B.1 System functionality

B.1.1 The packet 44 application enables flexible control of the units, km/h or mph used for the display of speed information on the ETCS Driver Machine Interface (DMI) as allowed by the specific case in the CCS TSI.

B.1.2 The application, in conjunction with an onboard configured set of default units per ETCS operating level, is used to determine the units to be used for speed display based on ETCS operating level and location. It is intended that all classes of ETCS fitted rolling stock that operate in the UK will utilise this packet as a means of controlling the displayed speed units.

B.2 Version management

B.2.1 Version compatibility of this packet 44 application is managed through the variable NID_VERSION contained within the packet 44 message.

B.3 Data structure and values

B.3.1 Header

B.3.1.1 The message or Eurobalise header is compliant with ETCS baseline 3 SRS.

B.3.2 Packet structure

V variable	Length (Bits)	Comment
NID_PACKET	8	= 44
Q_DIR	2	
L_PACKET	13	
NID_XUSER	9	= 9

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V ariable	Length (Bits)	Comment
NID_UKSYS	8	= 11
T_UKSTART	8	= 0
T_UKFINISH	8	= 0
NID_VERSION	8	= 1
Q_SCALE	2	Qualifier for the distance scale
M_LEVEL	3	Operating level to be overridden
NID_NTC	8	If M_LEVEL = 1 (NTC); National System identity
D_START_OVRD	15	Distance to override
L_END_OVRD	15	Length of override section
M_DMI_SPEED_UNITS_OVRD	2	Units of speed for override
N_ITER	5	
M_LEVEL(k)	3	
NID_NTC(k)	8	If M_LEVEL = 1 (NTC)
D_START_OVRD(k)	15	
L_END_OVRD(k)	15	
M_DMI_SPEED_UNITS_OVRD(k)	2	

B.3.3 Variables

B.3.3.1 The definitions of the variables are set out below.

NID_Version			
Name	Interface version		
Description	Unique interface version identifier for version and compatibility control		
Length of variable	Minimum value	Maximum value	Resolution / formula
8 bits	0	255	
Special / reserved values	0	= Reserved (message rejected)	

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Q_SCALE			
Name	Qualifier for the distance scale		
Description	Qualifier to indicate the same scale used for describing all distances inside the packet that contains Q_SCALE.		
Length of variable	Minimum value	Maximum value	Resolution / formula
2 bits	0	3	
Special / reserved values	0	10 cm scale	
	1	1 m scale	
	2	10 m scale	
	3	Spare	

M_LEVEL			
Name	Operating Level to be overridden		
Description			
Length of variable	Minimum value	Maximum value	Resolution / formula
3 bits	0	7	
Special / reserved values	0	Level 0	
	1	Level NTC specified by NID_NTC	
	2	Level 1	
	3	Level 2	
	4	Level 3	
	5-7	Spare	

NID_NTC			
Name	National System identity		
Description	Each value of this variable represents the identify of a National System as defined in ERA_ERTMS_040001.		
Length of variable	Minimum value	Maximum value	Resolution / formula
8 bits	0	255	

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D_START_OVRD			
Name	Distance to speed units override		
Description	The incremental distance to the execution of DMI speed units override. The origin of this distance is either: a) the location of the Eurobalise sending the packet, or, b) the Last Relevant Balise Group referred to in the message header when received from the RBC.		
Length of variable	Minimum value	Maximum value	Resolution / formula
15 bits	0 cm	327.660 km	10 cm, 1 m or 10 m depends on Q_SCALE
Special / reserved values	32767	Now (the override is performed upon receipt of the command)	

L_END_OVRD			
Name	Length of override section		
Description	The length of the override section starting from the distance indicated by D_START_OVRD		
Length of variable	Minimum value	Maximum value	Resolution / formula
15 bits	0 cm	327.660 km	10 cm, 1 m or 10 m depends on Q_SCALE
Special / reserved values	1111...1111	Infinite length	

M_DMI_SPEED_UNITS_OVRD			
Name	DMI speed units		
Description	The units for the train speed displayed on the DMI		
Length of variable	Minimum value	Maximum value	Resolution / formula
2 bits	0	3	
Special / reserved values	0	= Display default DMI speed units	
	1	= Display DMI speed units in km/h	
	2	= Display DMI speed units in mph	
	3	= Spare	

B.4 Design principles and application rules

B.4.1 The requirements for ERTMS/ETCS DMI equipment if a speed display in mph is required are set out in GE/RT8402, which defines NTRs for GB specific speed display switching method.

B.4.2 The requirement for using packet 44 based train speed unit override information is set out in section 2.1.2 of GE/RT8402. The associated guidance for the requirement provides rationale for the use of packet 44 function and example locations where the message might be used.

B.4.3 The structure of the packet 44 based message provides the ability to define an immediate override of display units, or to announce an override of display units to occur at a distant location, for a particular operating level or levels.

B.4.4 The train needs to provide the ability to accommodate both the 'stored and applied' and 'stored and pending' train speed unit override information, for ETCS operating Levels 0, 1, 2 and 3, and Level NTCs that are supported by the onboard.

B.4.5 Requirements on behaviours when a train speed unit override message demands an override of display units 'now' (D_START_OVRD set to 'now') or an override at a distance location, are set out in sections 2.1.8 and 2.1.9 of GERT8402.

B.4.6 The default speed display units for ETCS operating Levels 0, 1, 2 and 3, and Level NTCs are set out in sections 2.1.3 and 2.1.4 of GERT8402 respectively.

B.4.7 The effect of entering a given ETCS operating mode on stored train speed override information is set out in section 2.1.11 of GERT8402.

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Definitions

Correct Side Door Enable (CSDE)	A protective system for door control.
European Rail Traffic Management System (ERTMS)	Signalling and operation management system encompassing ETCS for control command, and GSM-R for voice and data.
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 (EUAR)	The European Union Agency for Railways (EUAR) is 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.
Fully automatic selective door operation (FASDO)	A type of door selection system.
Selective door operation (SDO)	A type of door selection system.
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 on-board system also supervises the speed of the train.
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.

Abbreviations

ATO	Automatic Train Operation.
ATS	Automatic Train Supervision.
CCS	Control, Command and Signalling.
CTS	Change of Traction System.
DMI	Driver Machine Interface.
GB	Great Britain.
NTC	National Train Control
NTR	National Technical Rule.
PH	Packet Header.
RU	Railway Undertaking.
SC	Standards Committee.

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References

The Catalogue of Railway Group Standards gives the current issue number and status of documents published by RSSB. This information is also available from www.rsb.co.uk/railway-group-standards.

RGSC 01	Railway Group Standards Code
RGSC 02	Standards Manual

Documents referenced in the text

Technical Specifications for Interoperability

CCS TSI	Control, Command and Signalling TSI as adopted by the Commission Regulation (EU) 2016/919 published in the Official Journal of the European Union on 15 June 2016
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Railway Group Standards

GERT8402	ERTMS/ETCS DMI National Requirements
RIS-8072-CCS	ERTMS National Identities Management

Other References

C80056/SPEC/SYS/00357	TASS SDO Balise Telegram Specification, Issue 01, September 2009
ERA_ERTMS_040001	Assignment of values to ETCS variables, version 1.18, ERA, 18th Nov 2015
Subset-026	ERTMS/ETCS Class 1 System Requirements Specification, v3.6.0, ERA, 13 May 2015
Subset-054	Responsibilities and rules for the assignment of values to ETCS variables, v3.0.0, ERA, 05 Dec 2011