

**ERTMS/ETCS**

**System Requirements Specification**

**Chapter 6**

**Management of older System Versions**

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## 6.1 Modification History

Issue Number Date	Modification / Description	Author
3.0.0 23/12/08	First and release version	Hougardy A.
3.0.1 22/12/09	Including the results of the editorial review of the SRS 3.0.0 and the other error CR's that are in state "Analysis completed" according to ERA CCM	Hougardy A.
3.1.0 22/02/10	Release version	Hougardy A.
3.1.1 08/11/10	Including all CR's that are in state "Analysis completed" according to ERA CCM, plus CR731.	Hougardy A.
3.2.0 22/12/10	Release version	Hougardy A.
3.2.1 13/12/11	Including all CR's that are in state "Analysis completed" according to ERA CCM.	Hougardy A.
3.3.0 07/03/12	Baseline 3 release version	Hougardy A.
3.3.1 04/04/14	CR's 1159, 1176, 1185	Gemine O.
3.3.2 23/04/14	Baseline 3 1 <sup>st</sup> maintenance pre-release version	Gemine O.
3.3.3 06/05/14	CR 1223 Baseline 3 1 <sup>st</sup> maintenance 2 <sup>nd</sup> pre-release version	Gemine O.
3.4.0 12/05/14	Baseline 3 1 <sup>st</sup> maintenance release version	Gemine O.
3.4.1 23/06/14	no change	Gemine O.
3.4.2 17/11/15	CR's 299, 1089, 1262, 1266, 1280	Gemine O.
3.4.3 16/12/15	Update due to overall CR consolation phase	Gemine O.
3.5.0 18/12/15	Baseline 3 2 <sup>nd</sup> release version as recommended to EC (see ERA-REC-123-2015/REC)	Gemine O.
3.5.1 28/04/16	No change	Gemine O.

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3.6.0 13/05/16	Baseline 3 2 <sup>nd</sup> release version	Hougardy A.
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## **6.3 Scope**

- 6.3.1.1 The chapter defines the composition of envelope of legally operated system versions, i.e. all the ERTMS/ETCS system versions that trackside shall be allowed to operate and that on-board equipment shall support.
- 6.3.1.2 By default, all the clauses listed in the other SRS chapters are applicable regardless of the system version operated (see SUBSET-104 § 6.1.3.2); this chapter includes the exceptions to those clauses and the additional clauses, which apply when the system version of some trackside constituents and/or the system version operated relates to a version number older than the last one introduced.

## **6.4 Envelope of legally operated system versions**

### **6.4.1 Incompatible versions**

6.4.1.1 The system version number  $X$ , which a trackside infrastructure is allowed to operate with, shall be one of the following: 1 or 2

### **6.4.2 Compatible versions**

6.4.2.1 Within system version number  $X = 1$ , the system version number  $Y$  that a trackside infrastructure is allowed to use shall be any of the following: 0 or 1

6.4.2.2 Within system version number  $X = 2$ , the system version number  $Y$  that a trackside infrastructure is allowed to use shall be any of the following: 0 or 1

## 6.5 Trackside requirements in relation to older system versions

### 6.5.1 Trackside areas operated with system version number X = 1

#### 6.5.1.1 Introduction

6.5.1.1.1 The section is applicable for trackside infrastructures that will be tendered and still operated with the system version number X = 1, after the entry into force of this release of the SRS.

6.5.1.1.2 Within a trackside infrastructure operated with the system version number X = 1, it shall be allowed to use the following values of M\_VERSION: 1.0, and 1.1

6.5.1.1.3 Within a trackside area operated with an RBC certified to the system version number X = 1, it shall also be allowed to use for balises the following values of M\_VERSION: 2.0 and 2.1.

6.5.1.1.3.1 Note: this configuration is meaningful in case the trains operating on this RBC area support the system version number X = 2 and the on-board requirements related to the trackside information marked with 2.0 or 2.1 are applicable regardless of the operated version (i.e. they are applied by the on-board equipment even if this latter operates with the system version number X = 1 ordered by RBC).

#### 6.5.1.2 Exceptions to chapter 3

6.5.1.2.1 Intentionally deleted.

6.5.1.2.1.1 Section 3.6.2.4 shall not apply.

6.5.1.2.2 Clause 3.7.1.1 b) shall be replaced with: "When needed, limitations related to the movement authority, i.e. Mode profile for On Sight or Shunting and signalling related speed restriction (see sections 3.12.4 and 3.11.6). Mode profile and Signalling related Speed restriction shall always be sent together with the MA to which the information belongs"

6.5.1.2.3 In clause 3.7.1.1 c), the bullet "Optionally Speed restriction to ensure a given permitted braking distance (see section 3.11. 11)" shall not apply.

6.5.1.2.4 In clause 3.7.2.4, the bullet "LX speed restrictions" shall not apply.

6.5.1.2.5 In clause 3.7.2.4, the bullet "Inhibition of revocable TSRs from balises in L2/3 (from RBC only)" shall not apply.

6.5.1.2.6 Clause 3.9.3.2 shall be replaced with: "The orders shall be sent via balise groups."

6.5.1.2.7 Clause 3.9.3.8.1 shall not apply.

6.5.1.2.8 Clause 3.11.3.2.2 c) shall not apply.

6.5.1.2.9 Clause 3.11.3.2.3.1 shall be replaced with: “If at least one other specific SSP is less restrictive than any “Cant Deficiency” SSP, it is the responsibility of the trackside engineering to ensure that for all possible combinations of international train categories a train might belong to, the ERTMS/ETCS on-board equipment will not replace the “Cant Deficiency” SSP as selected in 3.11.3.2.3 leading to an unsafe situation by applying the requirement 3.11.3.2.6”

6.5.1.2.10 Clause 3.11.5.12 shall not apply.

6.5.1.2.11 Clauses 3.11.9.1, 3.12.5.1, 3.12.5.2, 3.12.5.4, 3.12.5.5, 3.12.5.6, 3.12.5.7, 3.15.1.2.3.1 o) shall not apply.

6.5.1.2.12 Clauses 3.11.11.1, 3.11.11.2 shall not apply

6.5.1.2.13 Clause 3.12.3.4.3.2 shall not apply.

6.5.1.2.14 Clauses 3.12.3.1.11 and 3.12.3.5.1 shall not apply.

6.5.1.2.15 Clause 3.12.4.1 shall be replaced with: “It shall be possible for trackside to send a Mode Profile. The Mode Profile can request On Sight mode and Shunting mode.”

6.5.1.2.16 Intentionally deleted.

6.5.1.2.17 Clause 3.15.1.2.3.1 p) shall not apply.

**6.5.1.3 Exceptions to chapter 4**

6.5.1.3.1 Void.

**6.5.1.4 Exceptions to chapter 5**

6.5.1.4.1 Void.

**6.5.1.5 Exceptions to chapter 7**

6.5.1.5.1 Clause 7.3.3.5 shall be replaced with: “Exception: Packet 255 “End of Telegram” does not follow the above defined structure.”

6.5.1.5.2 The table 7.4.1.1 shall be replaced with:

Packet Number	Packet Name	Page N°
2	System Version Order	
3	National Values	
5	Linking	
6	Virtual Balise Cover order	
12	Level 1 Movement Authority	
15	Level 2/3 Movement Authority	
16	Repositioning Information	
21	Gradient Profile	
27	International Static Speed Profile	
39	Track Condition Change of traction system {1}	



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Packet Number	Packet Name	Page N°
41	Level Transition Order	
42	Session Management	
44	Data used by applications outside the ERTMS/ETCS system.	
45	Radio Network registration	
46	Conditional Level Transition Order	
49	List of balises for SH Area	
51	Axle load Speed Profile	
57	Movement Authority Request Parameters	
58	Position Report Parameters	
63	List of Balises in SR Authority	
65	Temporary Speed Restriction	
66	Temporary Speed Restriction Revocation	
67	Track Condition Big Metal Masses	
68	Track Condition {1}	
70	Route Suitability Data {1}	
71	Adhesion Factor	
72	Packet for sending plain text messages	
79	Geographical Position Information	
80	Mode profile	
90	Track Ahead Free up to level 2/3 transition location	
131	RBC transition order	
132	Danger for Shunting information	
133	Radio infill area information	
134	EOLM Packet	
135	Stop Shunting on desk opening	
136	Infill location reference	
137	Stop if in Staff Responsible	
138	Reversing area information	
139	Reversing supervision information	
140	Train running number from RBC	
141	Default Gradient for Temporary Speed Restriction	
145	Inhibition of balise group message consistency reaction	
200	Virtual Balise Cover marker	
203	National Values for braking curves	
206	Track Condition	
207	Route Suitability Data	
239	Track Condition Change of traction system	
254	Default balise, loop or RIU information	

{1}Note: used on lines where trains are operated with on-board equipment supporting only system version = 1.0.

6.5.1.5.2.1 The table 7.4.1.2 shall be replaced with:

Packet Number	Packet Name	Page N°
0	Position Report	
1	Position Report based on two balise groups	

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Packet Number	Packet Name	Page N°
3	Onboard telephone numbers	
4	Error Reporting	
9	Level 2/3 transition information	
11	Validated train data	
44	Data used by applications outside the ERTMS/ETCS system.	

6.5.1.5.3 Section 7.4.2.0 (Packet Number 0: Virtual Balise Cover marker) shall not apply.

6.5.1.5.4 Table 7.4.2.1.1 (Packet Number 3: National Values) shall be replaced with:

<b>Description</b>	Downloads a set of National Values to the train		
<b>Transmitted by</b>	Balise, RBC		
<b>Content</b>	<b>Variable</b>	<b>Length</b>	<b>Comment</b>
	NID_PACKET	8	
	Q_DIR	2	
	L_PACKET	13	
	Q_SCALE	2	
	D_VALIDNV	15	
	N_ITER	5	
	NID_C(k)	10	Identification of national area(s) to which the set applies
	V_NVSHUNT	7	
	V_NVSTFF	7	
	V_NVONSIGHT	7	
	V_NVUNFIT	7	
	V_NVREL	7	
	D_NVROLL	15	
	Q_NVSRBKTRG	1	
	Q_NVEMRRLS	1	
	V_NVALLOWOVTRP	7	
	V_NVSUPOVTRP	7	
	D_NVOVTRP	15	
	T_NVOVTRP	8	
	D_NVPOTRP	15	
	M_NVCONTACT	2	
	T_NVCONTACT	8	
	M_NVDERUN	1	
	D_NVSTFF	15	
	Q_NVDRIVER_ADHES	1	

6.5.1.5.5 Section 7.4.2.3.1 (Packet Number 13: Staff Responsible distance Information from loop) shall not apply.

6.5.1.5.6 Table 7.4.2.7 (Packet Number 27: International Static Speed Profile) shall be replaced with:

<b>Description</b>	Static speed profile and optionally speed limits depending on the international train category.		
<b>Transmitted by</b>	Any		
<b>Content</b>	<b>Variable</b>	<b>Length</b>	<b>Comment</b>
	NID_PACKET	8	
	Q_DIR	2	
	L_PACKET	13	
	Q_SCALE	2	
	D_STATIC	15	
	V_STATIC	7	
	Q_FRONT	1	
	N_ITER	5	
	NC_DIFF(n)	4	
	V_DIFF(n)	7	
	N_ITER	5	
	D_STATIC(k)	15	
	V_STATIC(k)	7	
	Q_FRONT(k)	1	
N_ITER(k)	5		
NC_DIFF(k,m)	4		
V_DIFF(k,m)	7		

6.5.1.5.7 Table 7.4.2.8 (Packet Number 39: Track Condition Change of traction system) shall be replaced with:

<b>Description</b>	The packet gives information about change of the traction system.		
<b>Transmitted by</b>	Any		
<b>Content</b>	<b>Variable</b>	<b>Length</b>	<b>Comment</b>
	NID_PACKET	8	
	Q_DIR	2	
	L_PACKET	13	
	Q_SCALE	2	
	D_TRACTION	15	
	M_TRACTION	8	Identity of the traction system

6.5.1.5.8 Section 7.4.2.8.1 (Packet Number 40: Track Condition Change of allowed current consumption) shall not apply.

6.5.1.5.9 Table 7.4.2.11 (Packet Number 44: Data used by applications outside the ERTMS/ETCS system) shall be replaced with:

<b>Description</b>	Messages between trackside and on-board devices, which contain information used by applications outside the ERTMS/ETCS system.		
<b>Transmitted by</b>	Any		
<b>Content</b>	<b>Variable</b>	<b>Length</b>	<b>Comment</b>
	NID_PACKET	8	
	Q_DIR	2	
	L_PACKET	13	
	NID_XUSER	9	
	Other data, depending on NID_XUSER		

6.5.1.5.10 Table 7.4.2.13 (Packet Number 51: Axle Load Speed Profile) shall be replaced with:

<b>Description</b>	This packet gives the speed restrictions for trains with axle load higher than or equal to the specified value for the speed restriction		
<b>Transmitted by</b>	Any		
<b>Content</b>	<b>Variable</b>	<b>Length</b>	<b>Comment</b>
	NID_PACKET	8	
	Q_DIR	2	
	L_PACKET	13	
	Q_SCALE	2	
	Q_TRACKINIT	1	
	D_AXLELOAD	15	
	L_AXLELOAD	15	
	Q_FRONT	1	
	N_ITER	5	
	M_AXLELOAD(n)	7	
	V_AXLELOAD(n)	7	Speed restriction to be applied if the axle load of the train $\geq$ M_AXLELOAD(n)
	N_ITER	5	
	D_AXLELOAD(k)	15	
	L_AXLELOAD(k)	15	
	Q_FRONT(k)	1	
	N_ITER(k)	5	

M_AXLELOAD(k,m)	7	
V_AXLELOAD(k,m)	7	Speed restriction to be applied if the axle load of the train $\geq$ M_AXLELOAD(k,m)

6.5.1.5.11 Section 7.4.2.13.1 (Packet Number 52: Permitted Braking Distance Information) shall not apply.

6.5.1.5.12 Section 7.4.2.16.1 (Packet Number 64: Inhibition of revocable TSRs from balises in L2/3) shall not apply.

6.5.1.5.13 Section 7.4.2.20.1 (Packet Number 69: Track Condition Station Platforms) shall not apply.

6.5.1.5.14 Table 7.4.2.21 (Packet Number 70: Route Suitability data) shall be replaced with:

<b>Description</b>	The packet gives the characteristics needed to enter a route.		
<b>Transmitted by</b>	Any		
<b>Content</b>	<b>Variable</b>	<b>Length</b>	<b>Comment</b>
	NID_PACKET	8	
	Q_DIR	2	
	L_PACKET	13	
	Q_SCALE	2	
	Q_TRACKINIT	1	
	D_TRACKINIT	15	Only if Q_TRACKINIT = 1
	D_SUITABILITY	15	Only If Q_TRACKINIT = 0, D_SUITABILITY and the following variables follows
	Q_SUITABILITY	2	
	M_AXLELOAD	7	If Q_SUITABILITY = Max axle load.
	M_TRACTION	8	If Q_SUITABILITY = traction system
	N_ITER	5	
	D_SUITABILITY(k)	15	
	Q_SUITABILITY(k)	2	
	M_AXLELOAD(k)	7	If Q_SUITABILITY(k) = Max axle load.
	M_TRACTION(k)	8	If Q_SUITABILITY(k) = traction system

6.5.1.5.15 Table 7.4.2.23 (Packet Number 72: Packet for sending plain text messages) shall be replaced with:

<b>Description</b>			
<b>Transmitted by</b>	Balise, RBC		
<b>Content</b>	<b>Variable</b>	<b>Length</b>	<b>Comment</b>
	NID_PACKET	8	
	Q_DIR	2	
	L_PACKET	13	
	Q_SCALE	2	
	Q_TEXTCLASS	2	
	Q_TEXTDISPLAY	1	
	D_TEXTDISPLAY	15	Start condition
	M_MODETEXTDISPLAY	4	Start condition
	M_LEVELTEXTDISPLAY	3	Start condition
	NID_NTC	8	If M_LEVELTEXTDISPLAY = 1 (NTC)
	L_TEXTDISPLAY	15	End condition
	T_TEXTDISPLAY	10	End condition
	M_MODETEXTDISPLAY	4	End condition
	M_LEVELTEXTDISPLAY	3	End condition
	NID_NTC	8	If M_LEVELTEXTDISPLAY = 1 (NTC)
	Q_TEXTCONFIRM	2	
L_TEXT	8		
X_TEXT(L_TEXT)	8		

6.5.1.5.16 Section 7.4.2.24 (Packet Number 76: Packet for sending fixed text messages) shall not apply.

6.5.1.5.17 Table 7.4.2.25 (Packet Number 79: Geographical Position Information) shall be replaced with:

<b>Description</b>	This packet gives geographical location information for one or multiple references to the train.		
<b>Transmitted by</b>	Balise, RBC		
<b>Content</b>	<b>Variable</b>	<b>Length</b>	<b>Comment</b>
	NID_PACKET	8	
	Q_DIR	2	
	L_PACKET	13	
	Q_SCALE	2	
	Q_NEWCOUNTRY	1	
	NID_C	10	if Q_NEWCOUNTRY = 1

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NID_BG	14	Geographical Position Reference Balise Group
D_POSOFF	15	
Q_MPOSITION	1	Geographical Position counting direction
M_POSITION	20	Track kilometre reference value
N_ITER	5	
Q_NEWCOUNTRY(k)	1	
NID_C(k)	10	if Q_NEWCOUNTRY(k) = 1
NID_BG(k)	14	Geographical Position Reference Balise Group
D_POSOFF(k)	15	
Q_MPOSITION(k)	1	Geographical Position counting direction
M_POSITION(k)	20	Track kilometre reference value

6.5.1.5.18 Table 7.4.2.26 (Packet Number 80: Mode profile) shall be replaced with:

<b>Description</b>	Mode profile associated to an MA		
<b>Transmitted by</b>	Any		
<b>Content</b>	<b>Variable</b>	<b>Length</b>	<b>Comment</b>
	NID_PACKET	8	
	Q_DIR	2	
	L_PACKET	13	
	Q_SCALE	2	
	D_MAMODE	15	
	M_MAMODE	2	OS, SH
	V_MAMODE	7	
	L_MAMODE	15	
	L_ACKMAMODE	15	
	N_ITER	5	
	D_MAMODE(k)	15	
	M_MAMODE(k)	2	OS, SH
	V_MAMODE(k)	7	
	L_MAMODE(k)	15	
	L_ACKMAMODE(k)	15	

6.5.1.5.19 Section 7.4.2.26.1 (Packet Number 88: Level Crossing information) shall not apply.

6.5.1.5.20 Section 7.4.2.37.1 (Packet Number 143: Session Management with neighbouring Radio Infill Unit) shall not apply.

6.5.1.5.20.1 Section 7.4.2.37.3 (Packet Number 180: LSSMA display toggle order) shall not apply.

6.5.1.5.20.2 Section 7.4.2.37.4 (Packet Number 181: Generic LS function marker) shall not apply.

6.5.1.5.21 Added section 7.4.2.37.3 (Packet Number 200: Virtual Balise Cover marker) shall apply:

Packet Number 200: Virtual Balise Cover marker

<b>Description</b>	Indication to on-board that the telegram can be ignored according to a VBC.		
<b>Transmitted by</b>	Balise		
<b>Content</b>	<b>Variable</b>	<b>Length</b>	<b>Comment</b>
	NID_PACKET	8	
	Q_DIR	2	
	L_PACKET	13	
	NID_VBCMK	6	

6.5.1.5.22 Added section 7.4.2.37.4 (Packet Number 203: National Values for braking curves) shall apply:

Packet Number 203: National Values for braking curves

<b>Description</b>	Downloads a subset of National Values to the train, used for braking curves. This subset is a complement to the National Values included in packet 3.		
<b>Transmitted by</b>	Balise, RBC		
<b>Content</b>	<b>Variable</b>	<b>Length</b>	<b>Comment</b>
	NID_PACKET	8	
	Q_DIR	2	
	L_PACKET	13	
	Q_NVGUIPERM	1	
	Q_NVSBFBPERM	1	
	Q_NVINHSMICPERM	1	
	A_NVMAXREDADH1	6	
	A_NVMAXREDADH2	6	
	A_NVMAXREDADH3	6	
	M_NVAVADH	5	
	M_NVEBCL	4	
	Q_NVKINT	1	
	Q_NVKVINTSET	2	Only if Q_NVKINT = 1, Q_NVKVINTSET and the following variables follow



A_NVP12	6	Only if Q_NVKVINTSET = 1
A_NVP23	6	Only if Q_NVKVINTSET = 1
V_NVKVINT	7	= 0km/h
M_NVKVINT	7	Valid between V_NVKVINT and V_NVKVINT(1) If Q_NVKVINTSET = 1, gives the correction factor if maximum emergency brake deceleration is lower than A_NVP12
M_NVKVINT	7	Only if Q_NVKVINTSET = 1 Valid between V_NVKVINT and V_NVKVINT(1) Gives the correction factor if maximum emergency brake deceleration is higher than A_NVP23
N_ITER	5	
V_NVKVINT(n)	7	
M_NVKVINT(n)	7	Valid between V_NVKVINT(n) and V_NVKVINT(n+1) If Q_NVKVINTSET = 1, gives the correction factor if maximum emergency brake deceleration is lower than A_NVP12
M_NVKVINT(n)	7	Only if Q_NVKVINTSET = 1 Valid between V_NVKVINT(n) and V_NVKVINT(n+1) Gives the correction factor if maximum emergency brake deceleration is higher than A_NVP23
N_ITER	5	
Q_NVKVINTSET(k)	2	
A_NVP12(k)	6	Only if Q_NVKVINTSET(k) = 1
A_NVP23(k)	6	Only if Q_NVKVINTSET(k) = 1
V_NVKVINT(k)	7	= 0km/h

M_NVKVINT(k)	7	Valid between V_NVKVINT(k) and V_NVKVINT(k,1) If Q_NVKVINTSET(k) = 1, gives the correction factor if maximum emergency brake deceleration is lower than A_NVP12(k)
M_NVKVINT(k)	7	Only if Q_NVKVINTSET(k) = 1 Valid between V_NVKVINT(k) and V_NVKVINT(k,1) Gives the correction factor if maximum emergency brake deceleration is higher than A_NVP23(k)
N_ITER(k)	5	
V_NVKVINT(k,m)	7	
M_NVKVINT(k,m)	7	Valid between V_NVKVINT(k,m) and V_NVKVINT(k,m+1) If Q_NVKVINTSET(k) = 1, gives the correction factor if maximum emergency brake deceleration is lower than A_NVP12(k)
M_NVKVINT(k,m)	7	Only if Q_NVKVINTSET(k) = 1 Valid between V_NVKVINT(k,m) and V_NVKVINT(k,m+1) Gives the correction factor if maximum emergency brake deceleration is higher than A_NVP23(k)
L_NVKRINT	5	= 0m
M_NVKRINT	5	Valid between L_NVKRINT and L_NVKRINT(1)
N_ITER	5	
L_NVKRINT(l)	5	
M_NVKRINT(l)	5	Valid between L_NVKRINT(l) and L_NVKRINT(l+1)
M_NVKTINT	5	

6.5.1.5.23 Added section 7.4.2.37.5 (Packet Number 206: Track Condition) shall apply:

Packet Number 206: Track Condition

<b>Description</b>	The packet gives details concerning the track ahead to support the driver when e.g. lower pantograph		
<b>Transmitted by</b>	Any		
<b>Content</b>	<b>Variable</b>	<b>Length</b>	<b>Comment</b>
	NID_PACKET	8	
	Q_DIR	2	
	L_PACKET	13	
	Q_SCALE	2	
	Q_TRACKINIT	1	
	D_TRACKINIT	15	Only if Q_TRACKINIT = 1
	D_TRACKCOND	15	Only if Q_TRACKINIT = 0, D_TRACKCOND and the following variables follow
	L_TRACKCOND	15	
	M_TRACKCONDBC	4	
	N_ITER	5	
	D_TRACKCOND(k)	15	
L_TRACKCOND(k)	15		
M_TRACKCONDBC(k)	4		

6.5.1.5.24 Added section 7.4.2.37.6 (Packet Number 207: Route Suitability Data) shall apply:

Packet Number 207: Route Suitability Data

<b>Description</b>	The packet gives the characteristics needed to enter a route.		
<b>Transmitted by</b>	Any		
<b>Content</b>	<b>Variable</b>	<b>Length</b>	<b>Comment</b>
	NID_PACKET	8	
	Q_DIR	2	
	L_PACKET	13	
	Q_SCALE	2	
	Q_TRACKINIT	1	
	D_TRACKINIT	15	Only if Q_TRACKINIT = 1
	D_SUITABILITY	15	Only If Q_TRACKINIT = 0, D_SUITABILITY and the following variables follows
	Q_SUITABILITY	2	
	M_LINEGAUGE	8	If Q_SUITABILITY = loading gauge

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M_AXLELOADCAT	7	If Q_SUITABILITY = Max axle load.
M_VOLTAGE	4	If Q_SUITABILITY = traction system
NID_CTRACTION	10	If Q_SUITABILITY = traction system and M_VOLTAGE ≠ 0
N_ITER	5	
D_SUITABILITY(k)	15	
Q_SUITABILITY(k)	2	
M_LINEGAUGE(k)	8	If Q_SUITABILITY = loading gauge
M_AXLELOADCAT(k)	7	If Q_SUITABILITY = Max axle load.
M_VOLTAGE(k)	4	If Q_SUITABILITY = traction system
NID_CTRACTION(k)	10	If Q_SUITABILITY = traction system and M_VOLTAGE ≠ 0

6.5.1.5.25 Added section 7.4.2.37.7 (Packet Number 239: Track Condition Change of traction system) shall apply:

Packet Number 239: Track Condition Change of traction system

<b>Description</b>	The packet gives information about change of the traction system.		
<b>Transmitted by</b>	Any		
<b>Content</b>	<b>Variable</b>	<b>Length</b>	<b>Comment</b>
	NID_PACKET	8	
	Q_DIR	2	
	L_PACKET	13	
	Q_SCALE	2	
	D_TRACTION	15	
	M_VOLTAGE	4	Identity of the traction system
	NID_CTRACTION	10	NID_CTRACTION given only if M_VOLTAGE ≠ 0

6.5.1.5.25.1 Added Section 7.4.3.3.1 (Packet Number 3: On-board telephone numbers) shall apply:

Packet Number 3: On-board telephone numbers

<b>Description</b>	Telephone numbers associated to the on-board equipment		
<b>Transmitted to</b>	RBC, RIU		
<b>Content</b>	<b>Variable</b>	<b>Length</b>	<b>Comment</b>

NID_PACKET	8	
L_PACKET	13	
N_ITER	5	
NID_RADIO (k)	64	

6.5.1.5.25.2 Table 7.4.3.5 (Packet Number 11: Validated train data) shall be replaced with:

<b>Description</b>	Validated train data.		
<b>Transmitted to</b>	RBC		
<b>Content</b>	<b>Variable</b>	<b>Length</b>	<b>Comment</b>
	NID_PACKET	8	
	L_PACKET	13	
	NID_OPERATIONAL	32	
	NC_TRAIN	15	
	L_TRAIN	12	
	V_MAXTRAIN	7	
	M_LOADINGGAUGE	8	
	M_AXLELOAD	7	
	M_AIRTIGHT	2	
	N_ITER	5	
	M_TRACTION (k)	8	Type of traction system
	N_ITER	5	
NID_NTC (k)	8	Type of National System available	

6.5.1.5.26 Table 7.5.1.36 (D\_VALIDNV) shall be replaced with:

<b>Name</b>	Distance to start of validity of national values		
<b>Description</b>			
<b>Length of variable</b>	<b>Minimum Value</b>	<b>Maximum Value</b>	<b>Resolution/formula</b>
15 bits	0 cm	327.670 km	10 cm, 1m or 10 m depends on Q_SCALE

6.5.1.5.27 Added section 7.5.1.62.2 (M\_AXLELOAD) shall apply:

**M\_AXLELOAD**

<b>Name</b>	Axle load		
<b>Description</b>			
<b>Length of variable</b>	<b>Minimum Value</b>	<b>Maximum Value</b>	<b>Resolution/formula</b>
7 bits	0 t	40 t	0.5 t
<b>Special/Reserved Values</b>	101 0001	Spare	
	...	...	
	111 1101	Spare	
	111 1110	Axle load above 40 t	

111 1111	Spare
----------	-------

6.5.1.5.27.1 Table 7.5.1.64 (M\_ERROR) shall be replaced with:

<b>Name</b>	Identifier of the type of error		
<b>Description</b>			
<b>Length of variable</b>	<b>Minimum Value</b>	<b>Maximum Value</b>	<b>Resolution/formula</b>
8 bits			
<b>Special/Reserved Values</b>	0	Balise group: linking consistency error (ref. 3.16.2.3)	
	1	Linked balise group: message consistency error (ref. 3.16.2.4.1/4)	
	2	Unlinked balise group: message consistency error (ref. 3.16.2.5)	
	3	Radio: message consistency error (ref. 3.16.3.1.1a,c)	
	4	Radio: sequence error (ref. 3.16.3.1.1b)	
	5	Radio: safe radio connection error (ref. 3.16.3.4, to be sent when communication links re-established)	
	6	Non safety critical failure	
	7	Safety critical failure (ref 4.4.6.1.6 , 4.4.15.1.5)	
	8-255	Spare	

6.5.1.5.27.2 Table 7.5.1.68 (M\_LOADINGGAUGE) shall be replaced with:

<b>Name</b>	Loading gauge		
<b>Description</b>	Defining the loading gauge profile of a train (refer to TSI RST)		
<b>Length of variable</b>	<b>Minimum Value</b>	<b>Maximum Value</b>	<b>Resolution/formula</b>
8 bits			
<b>Special/Reserved Values</b>	0	No loading gauge is defined for the train	
	1-255	Non interoperable value (this is not a spare value)	

6.5.1.5.28 Table 7.5.1.70 (M\_MAMODE) shall be replaced with:

<b>Name</b>	Required mode for a part of the MA		
<b>Description</b>			
<b>Length of variable</b>	<b>Minimum Value</b>	<b>Maximum Value</b>	<b>Resolution/formula</b>
2 bits			
<b>Special/Reserved Values</b>	00	On Sight	
	01	Shunting	
	10 – 11	Spare	

6.5.1.5.28.1 Table 7.5.1.72 (M\_MODE) shall be replaced with:

<b>Name</b>	Onboard operating mode		
<b>Description</b>			
<b>Length of variable</b>	<b>Minimum Value</b>	<b>Maximum Value</b>	<b>Resolution/formula</b>
4 bits			
<b>Special/Reserved Values</b>	0	Full Supervision	

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1	On Sight
2	Staff Responsible
3	Shunting
4	Unfitted
5	Sleeping
6	Stand By
7	Trip
8	Post Trip
9	System Failure
10	Isolation
11	Non Leading
12	If reported level is NTC, National System; otherwise, Limited Supervision
13	National System
14	Reversing
15	Spare

6.5.1.5.29 Table 7.5.1.73 (M\_MODETEXTDISPLAY) shall be replaced with:

Name	Onboard operating mode for text display		
Description	The text is displayed when entering / as long as in the defined mode		
Length of variable	Minimum Value	Maximum Value	Resolution/formula
4 bits			
Special/Reserved Values	0	Full Supervision	
	1	On Sight	
	2	Staff Responsible	
	3	Spare	
	4	Unfitted	
	5	Spare	
	6	Stand By	
	7	Trip	
	8	Post Trip	
	9	Spare	
	10	Spare	
	11	Spare	
	12	Spare	
	13	Spare	
	14	Reversing	
15	The display of the text shall not be limited by the mode.		

6.5.1.5.30 Table 7.5.1.76 (M\_POSITION) shall be replaced with:

<b>Name</b>	Track kilometre reference value		
<b>Description</b>	The geographical position reporting function uses this variables content as a reference value.		
<b>Length of variable</b>	<b>Minimum Value</b>	<b>Maximum Value</b>	<b>Resolution/formula</b>
20 bits	0 m	1'048'574 m	1 m
<b>Special/Reserved Values</b>	1'048'575	No more geographical position calculation after this reference location	

6.5.1.5.31 Table 7.5.1.77 (M\_TRACKCOND) shall be replaced with:

<b>Name</b>	Type of track condition		
<b>Description</b>			
<b>Length of variable</b>	<b>Minimum Value</b>	<b>Maximum Value</b>	<b>Resolution/formula</b>
4 bits			
<b>Special/Reserved Values</b>	0000	Non stopping area – tunnel. Initial state: stopping permitted (no tunnel)	
	0001	Non stopping area – bridge. Initial state: stopping permitted (no bridge)	
	0010	Non stopping area – other reasons. Initial state: stopping permitted	
	0011	Powerless section – lower pantograph. Initial state: not powerless section	
	0100	Radio hole (stop supervising T_NVCONTACT). Initial state: supervise T_NVCONTACT	
	0101	Air tightness. Initial state: no request for air tightness	
	0110	Switch off regenerative brake. Initial state: regenerative brake on	
	0111	Switch off eddy current brake for service brake. Initial state: eddy current brake for service brake on	
	1000	Switch off magnetic shoe brake. Initial state: magnetic shoe brake on	
	1001	Powerless section – switch off the main power switch. Initial state: not powerless section	
	1010 –1111	Spare	

6.5.1.5.32 Added section 7.5.1.77.1 (M\_TRACKCONDBC) shall apply:

M\_TRACKCONDBC

<b>Name</b>	Type of track condition		
<b>Description</b>			
<b>Length of variable</b>	<b>Minimum Value</b>	<b>Maximum Value</b>	<b>Resolution/formula</b>
4 bits			
<b>Special/Reserved Values</b>	0000	Non stopping area. Initial state: stopping permitted	
	0001	Tunnel stopping area. Initial state: no tunnel stopping area	
	0010	Sound horn. Initial state: no request for sound horn	
	0011	Powerless section – lower pantograph. Initial state: not powerless section	
	0100	Radio hole (stop supervising T_NVCONTACT). Initial state: supervise T_NVCONTACT	
	0101	Air tightness. Initial state: no request for air tightness	
	0110	Switch off regenerative brake. Initial state: regenerative brake on	



0111	Switch off eddy current brake for service brake. Initial state: eddy current brake for service brake on
1000	Switch off magnetic shoe brake. Initial state: magnetic shoe brake on
1001	Powerless section – switch off the main power switch. Initial state: not powerless section
1010	Switch off eddy current brake for emergency brake. Initial state: eddy current brake for emergency brake on
1011 –1111	Spare

6.5.1.5.33 Added section 7.5.1.77.1 (M\_TRACTION) shall apply:

M\_TRACTION

<b>Name</b>	Traction system		
<b>Description</b>	It indicates the traction system installed on a specific line or respectively that can be used by an engine		
<b>Length of variable</b>	<b>Minimum Value</b>	<b>Maximum Value</b>	<b>Resolution/formula</b>
8 bits			
<b>Special/Reserved Values</b>	0	Line not fitted with any traction system	
	1	3 kV DC, Italy	
	2	25 kV AC 50 Hz, Conventional lines France	
	3	25 kV AC 50 Hz, High speed lines France	
	4	Non interoperable value (this is not a spare value)	
	5	1.5 kV DC, France	
	6	1.5 kV DC, Netherlands	
	7	25 kV AC 50 Hz, Conventional lines Netherlands	
	8	25 kV AC 50 Hz, High speed lines Netherlands	
	9-10	Non interoperable value (this is not a spare value)	
	11	15kV AC 16 2/3 Hz, max. train current 600A Germany	
	12	15kV AC 16 2/3 Hz, max. train current 780A Germany	
	13	15kV AC 16 2/3 Hz, max. train current 900A Germany	
	14	Non interoperable value (this is not a spare value)	
	15	15kV AC 16 2/3 Hz, max. train current 1500A Germany	
	16-25	Non interoperable value (this is not a spare value)	
	26	25 kV AC 50 Hz, Italy	
	27-30	Non interoperable value (this is not a spare value)	
	31	25 kV AC 50 Hz, 1600mm, High speed lines Spain	
	32	3 kV DC, Conventional lines 220 km/h Spain	
	33	3 kV DC, Conventional lines 160 km/h Spain	
	34	25 kV AC 50 Hz, 1600mm/1950mm, High speed lines Spain	
	35-40	Non interoperable value (this is not a spare value)	
	41	15 kV AC 16 2/3 Hz, 1320mm/1450 mm, Switzerland	
	42	15 kV AC 16 2/3 Hz, 1450 mm/1600 mm, Switzerland	

43	15 kV AC 16 2/3 Hz, 1950 mm, Switzerland
44	15 kV AC 16 2/3 Hz, 1320 mm/1450 mm/1600 mm, Switzerland
45	15 kV AC 16 2/3 Hz, 1450 mm/1600mm/1950 mm, Switzerland
46	15 kV AC 16 2/3 Hz, 1320 mm/1450mm/1600mm/1950 mm, Switzerland
47-255	Non interoperable value (this is not a spare value)

6.5.1.5.34 Table 7.5.1.83 (NC\_DIFF) shall be replaced with:

<b>Name</b>	Specific SSP category		
<b>Description</b>	<p>It is the specific SSP category for which a differential value for the static line speed exists.</p> <p>Used together with V_DIFF to permit trains belonging to the corresponding international train category to go faster or lower than the "international basic static speed" given by V_STATIC.</p> <p>Value 0 of NC_DIFF corresponds to the LSB of NC_TRAIN, value 14 of NC_DIFF to MSB (15-bit variable) of NC_TRAIN.</p>		
<b>Length of variable</b>	<b>Minimum Value</b>	<b>Maximum Value</b>	<b>Resolution/formula</b>
4 bits	0	15	Numbers
<b>Special/Reserved Values</b>	0	Specific SSP applicable to Cant Deficiency 275 mm	
	1	Specific SSP applicable to Cant Deficiency 80 mm	
	2	Specific SSP applicable to Cant Deficiency 100 mm	
	3	Specific SSP applicable to Cant Deficiency 130 mm	
	4	Specific SSP applicable to Cant Deficiency 150 mm	
	5	Specific SSP applicable to Cant Deficiency 165 mm	
	6	Specific SSP applicable to Cant Deficiency 180 mm	
	7	Specific SSP applicable to Cant Deficiency 225 mm	
	8	Specific SSP applicable to Cant Deficiency 300 mm	
	9	Specific SSP applicable to Freight train braked in "P" position	
	10	Specific SSP applicable to Freight train braked in "G" position	
	11	Specific SSP applicable to Passenger train	
	12	Specific SSP applicable to Cant Deficiency 245 mm	
	13	Specific SSP applicable to Cant Deficiency 210 mm	
	14-15	Spare	

6.5.1.5.34.1 Table 7.5.1.84 (NC\_TRAIN) shall be replaced with:

<b>Name</b>	International Train Category.		
<b>Description</b>	<p>Train category to which the train belongs.</p> <p>Thanks to NC_TRAIN, the train knows the "Specific" SSP category it must consider.</p> <p>By receiving a list of static speed profile, thanks to NC_DIFF, the train can select the SSP it must obey.</p> <p>Each bit represents one category.</p> <p>A train can belong to various categories.</p>		
<b>Length of variable</b>	<b>Minimum Value</b>	<b>Maximum Value</b>	<b>Resolution/formula</b>
15 bits			Bitset

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<b>Special/Reserved Values</b>	000 0000 0000 0000	Train does not belong to any of the "International" Train Category
	xxx xxxx xxxx xxx1	Cant Deficiency 275 mm
	xxx xxxx xxxx xx1x	Cant Deficiency 80 mm
	xxx xxxx xxxx x1xx	Cant Deficiency 100 mm
	xxx xxxx xxx 1xxx	Cant Deficiency 130 mm
	xxx xxxx xxx1 xxxx	Cant Deficiency 150 mm
	xxx xxxx xx1x xxxx	Cant Deficiency 165 mm
	xxx xxxx x1xx xxxx	Cant Deficiency 180 mm
	xxx xxxx 1xxx xxxx	Cant Deficiency 225 mm
	xxx xxx1 xxxx xxxx	Cant Deficiency 300 mm
	xxx xx1x xxxx xxxx	Freight train braked in "P" position
	xxx x1xx xxxx xxxx	Freight train braked in "G" position
	xxx 1xxx xxxx xxxx	Passenger train
	xx1 xxxx xxxx xxxx	Cant Deficiency 245 mm
	x1x xxxx xxxx xxxx	Cant Deficiency 210 mm
	1xx xxxx xxxx xxxx	Spare

6.5.1.5.34.2 Table 7.5.1.92 (NID\_OPERATIONAL) shall be replaced with:

<b>Name</b>	Train Running Number		
<b>Description</b>	This is the operational train running number.		
<b>Length of variable</b>	<b>Minimum Value</b>	<b>Maximum Value</b>	<b>Resolution/formula</b>
32 bits	0	9999 9999	Binary Coded Decimal
<b>Special/Reserved Values</b>	For each digit ;		
	Values A – E	Spare	
	F	Use value F for digit to indicate no digit (if number shorter than 8 digits)	
	FFFF FFFF	Unknown	

6.5.1.5.34.3 Table 7.5.1.107 (Q\_EMERGENCYSTOP) shall be replaced with:

<b>Name</b>	Qualifier for emergency stop acknowledgement		
<b>Description</b>	Qualifier to indicate whether the train has accepted or not a conditional emergency stop. For an unconditional emergency stop, it is set to "not relevant"		
<b>Length of variable</b>	<b>Minimum Value</b>	<b>Maximum Value</b>	<b>Resolution/formula</b>
2 bits			
<b>Special/Reserved Values</b>	0	Conditional Emergency Stop accepted	
	1	Conditional Emergency Stop rejected	
	2	Not Relevant (Unconditional Emergency Stop)	
	3	Spare	

6.5.1.5.35 Table 7.5.1.138 (Q\_TEXTCONFIRM) shall be replaced with:

<b>Name</b>	Qualifies the need / reaction of text confirmation
-------------	--

<i>Description</i>			
<i>Length of variable</i>	<i>Minimum Value</i>	<i>Maximum Value</i>	<i>Resolution/formula</i>
2 bits			
<i>Special/Reserved Values</i>	00	No confirmation required	
	01	Continue display until confirmed	
	10	Apply service brake if not confirmed when end conditions reached	
	11	Spare	

6.5.1.5.35.1 Added section 7.5.1.140.1 (Q\_TRACKDEL) shall apply:

<i>Name</i>	Track description deleted.		
<i>Description</i>	Qualifier to indicate whether the onboard has deleted (for any reason) track description or not.		
<i>Length of variable</i>	<i>Minimum Value</i>	<i>Maximum Value</i>	<i>Resolution/formula</i>
1 bit			
<i>Special/Reserved Values</i>	0	No track description deleted	
	1	Track description deleted	

6.5.1.5.36 Note: the packets listed above, which are not allowed for use in balise telegrams/loop messages marked with system version number X = 1 or in messages from RBC/RIU operating with system version number X = 1, may contain variables that have been introduced in the system version number X = 2. These variables are not mentioned in this section, since their use is implicitly forbidden by the fact that the packets using them are not allowed.

### 6.5.1.6 Exceptions to chapter 8

6.5.1.6.1 Clause 8.4.1.4.5 shall not apply.

6.5.1.6.2 Clause 8.4.1.4.8 shall be replaced with “Exception 8: A message transmitted by a balise group can contain several packets 200 (Virtual Balise Cover marker).”

6.5.1.6.3 The table under clause 8.4.2.1 shall be replaced with:

General Format of Balise Telegram			
Field No.	VARIABLE	Length ( bits)	Remarks
1	Q_UPDOWN	1	Defines the direction of the information: Down-link telegram (train to track) (0) Up-link telegram (track to train) (1)
2	M_VERSION	7	Version of the ERTMS/ETCS system.
3	Q_MEDIA	1	Defines the type of media: Balise (0)
4	N_PIG	3	Position in the group. Defines the position of the balise in the balise group.
5	N_TOTAL	3	Total number of balises in the balise group
6	M_DUP	2	Used to indicate whether the information of the balise is a duplicate of the balise before or after this one.
7	M_MCOUNT	8	Message counter (M_MCOUNT) - 8 bits. To enable detection of a change of balise group message during passage of the balise group.
8	NID_C	10	Country or region.
9	NID_BG	14	Identity of the balise group.
10	Q_LINK	1	Marks the balise group as linked (Q_LINK = 1) or unlinked (Q_LINK = 0)
	Packet 200 (optional)	29	Virtual Balise Cover marker
	Information	Variable	This information is composed according to the rules applicable for packets.
	Packet 255	8	Finishing flag of the telegram

6.5.1.6.4 Clause 8.4.2.3 shall be replaced with “When used, the packet 200 shall be transmitted as the first packet of the telegram (i.e. it is appended to the header).”

6.5.1.6.5 The table under clause 8.4.4.1 shall be replaced with:

Track to Train message	Mess. ID	Optional packets
SR Authorisation	2	63
Movement Authority	3	21, 27, 49, 80, plus common optional packets
Request To Shorten MA	9	80
General Message	24	From RBC: 21, 27, plus common optional packets From RIU: 45, 254
SH authorised	28	49, plus common optional packets
MA with Shifted Location Reference	33	21, 27, 80, plus common optional packets
Infill MA	37	5, 21, 27, 39, 41, 44, 51, 65, 66, 68, 70, 71, 80, 138, 139, 206, 207, 239

6.5.1.6.6 The table under clause 8.4.4.1.1 shall be replaced with:

**Common optional packets**

3, 5, 39, 51, 41, 42, 44, 45, 57, 58, 65, 66, 68, 70, 71, 72, 79, 131, 138, 139, 140, 203, 206, 207, 239

6.5.1.6.6.1 Clause 8.4.4.2 shall be replaced with: “The train to track message 136 (Train Position Report) and 157 (SoM Position Report) may optionally include the following packets:

- a) Packet 4 (Error Reporting),
- b) Packet 44 (Data used by applications outside the ERTMS/ETCS system).”

6.5.1.6.6.2 Table 8.5.2 shall be replaced with:

Mes. Id.	Message Name	Type	Invariant	Transmitted to
129	Validated Train Data	N	No	RBC
130	Request for Shunting	N	No	RBC
132	MA Request	N	No	RBC
136	Train Position Report	N	No	RBC, RIU
137	Request to shorten MA is granted	N	No	RBC
138	Request to shorten MA is rejected	N	No	RBC
146	Acknowledgement	N	No	RBC, RIU
147	Acknowledgement of Emergency Stop	N	No	RBC
149	Track Ahead Free Granted	N	No	RBC
150	End of Mission	N	No	RBC
153	Radio infill request	N	No	RIU
154	No compatible version supported	N	Yes	RBC, RIU
155	Initiation of a communication session	N	Yes	RBC, RIU
156	Termination of a communication session	N	Yes	RBC, RIU
157	SoM Position Report	N	No	RBC
159	Session Established	N	No	RBC, RIU

6.5.1.6.6.3 Table 8.6.3 (Message 132: MA Request) shall be replaced with:

Field No.	VARIABLE/ PACKET	Remarks
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1	NID_MESSAGE	
2	L_MESSAGE	
3	T_TRAIN	
4	NID_ENGINE	
5	Q_TRACKDEL	
6	Packet 0 or 1	
7	Optional packets	

6.5.1.6.6.4 Section 8.6.16 (Message 158: Text Message Acknowledged by Driver) shall not apply.

6.5.1.6.6.5 Table 8.6.17 (Message 159: Session established) shall be replaced with:

Field No.	VARIABLE/ PACKET	Remarks
1	NID_MESSAGE	
2	L_MESSAGE	
3	T_TRAIN	
4	NID_ENGINE	
5	Packet 3	

6.5.1.6.6.7 Table 8.7.6 (Message 15: Conditional Emergency Stop) shall be replaced with:

Field No.	VARIABLE	Remarks
1	NID_MESSAGE	
2	L_MESSAGE	
3	T_TRAIN	
4	M_ACK	
5	NID_LRBG	
6	NID_EM	Identification Number of the Emergency Stop Message.
7	Q_SCALE	
8	Q_DIR	
9	D_EMERGENCYSTOP	Distance between LRBG and the position reference to the emergency stop.

6.5.1.6.6.8 Table 8.7.14 (Message 34: Track Ahead Free Request) shall be replaced with:

Field No.	VARIABLE	Remarks
1	NID_MESSAGE	
2	L_MESSAGE	
3	T_TRAIN	
4	M_ACK	
5	NID_LRBG	
6	Q_SCALE	
7	Q_DIR	
8	D_TAFDISPLAY	
9	L_TAFDISPLAY	

6.5.1.6.6.9 Intentionally deleted.

6.5.1.6.6.10 Note: Packets or variables that have been introduced in the system version number X = 2, which cannot be contained within messages transmitted to an RBC operating with system version number X = 1, are not mentioned in the section 6.5.1.5.

### 6.5.1.7 Additional requirements

- 6.5.1.7.1 Any balise telegram, which includes the packet 2, the packet 6, the packet 135, the packet 145, the packet 200, the packet 203, the packet 206, the packet 207 or the packet 239, shall be marked with the system version number 1.1.
- 6.5.1.7.2 An RBC that uses the packet 203, the packet 206, the packet 207 or the packet 239 shall transmit a system version number equal to 1.1, when negotiating the establishment of the communication session.
- 6.5.1.7.3 Any message transmitted by loop, which includes the packet 206, the packet 207 or the packet 239, shall be marked with the system version number 1.1.
- 6.5.1.7.4 An RIU that uses the packet 206, the packet 207 or the packet 239 shall transmit a system version number equal to 1.1, when negotiating the establishment of the communication session.
- 6.5.1.7.5 A balise group or RBC message including the packet 203 shall also include the packet 3 (i.e. in a message, the packet 203 cannot be transmitted without the packet 3).
- 6.5.1.7.6 In the packet 70, the use of the value "00" of the variable Q\_SUITABILITY shall be forbidden.

## **6.5.2 Trackside areas operated with system version number X = 2**

### **6.5.2.1 General**

- 6.5.2.1.1 This section is applicable for trackside infrastructures that were operated with the system version number X = 1, before the migration to the system version number X = 2.
  - 6.5.2.1.1.1 This section is also applicable for trackside infrastructures with RBCs/RIUs certified to the system version number X.Y = 2.0 or for trackside infrastructures with RBCs/RIUs certified to the system version number X.Y = 2.1 where trains are operated with on-board equipment whose highest supported system version number X.Y is only 2.0.
- 6.5.2.1.2 Within a trackside infrastructure operated with the system version number X = 2, it shall be allowed to use the following values of M\_VERSION: 1.0, 1.1, 2.0 and 2.1

### **6.5.2.2 Exceptions to chapter 3, 4, 5**

- 6.5.2.2.1 For RBCs certified to the system version number 2.0 and for RBCs certified to the system version number 2.1 handing over a train fitted with an on-board equipment whose highest supported system version number X.Y is only 2.0, the bullet "The system versions supported by the on-board equipment" in clause 3.15.1.2.1 b) shall not apply.

### **6.5.2.3 Exceptions to chapter 7, 8**

- 6.5.2.3.1 For the balise telegrams/loop messages marked with the system version number 1.0 or 1.1 and for messages transmitted by RIUs certified to the system version number 1.0 or 1.1, the exceptions listed in sections 6.5.1.5 and 6.5.1.6 shall apply by analogy.



6.5.2.3.2 For RBCs/RIUs certified to the system version number 2.0, the following exceptions shall apply:

6.5.2.3.2.1 The table 7.4.1.2 shall be replaced with:

Packet Number	Packet Name	Page N°
0	Position Report	
1	Position Report based on two balise groups	
3	On-board telephone numbers	
4	Error Reporting	
5	Train running number	
9	Level 2/3 transition information	
11	Validated train data	
44	Data used by applications outside the ERTMS/ETCS system.	

6.5.2.3.2.2 The clauses 6.5.1.5.25.1 and 6.5.1.6.6.5 shall apply.

6.5.2.3.2.3 Note: Packets or variables that have been introduced in the system version number X.Y = 2.1, which cannot be contained within messages transmitted to an RBC operating with system version number X.Y = 2.0, are not mentioned in this section 6.5.2.3.2.

6.5.2.3.3 For RBCs/RIUs certified to the system version number 2.1, the following exceptions shall apply:

6.5.2.3.3.1 The table 7.4.1.2 shall be replaced with:

Packet Number	Packet Name	Page N°
0	Position Report	
1	Position Report based on two balise groups	
2	On-board supported system versions	
3	On-board telephone numbers {1}	
4	Error Reporting	
5	Train running number	
9	Level 2/3 transition information	
11	Validated train data	
44	Data used by applications outside the ERTMS/ETCS system.	

{1}Note: used by on-board equipment whose highest supported system version = 2.0.

6.5.2.3.3.2 The clause 6.5.1.5.25.1 shall apply.

6.5.2.3.3.3 The table 8.6.17 (Message 159: Session established) shall be replaced with:

Field No.	VARIABLE/ PACKET	Remarks
-----------	------------------	---------

1	NID_MESSAGE	
2	L_MESSAGE	
3	T_TRAIN	

4	NID_ENGINE
5	Packet 2 or 3

## 6.6 On-board requirements in relation to older system versions

### 6.6.1 Introduction

6.6.1.1 This section covers the following situations:

- a) Train is running on a trackside infrastructure operated with system version number  $X = 1$
- b) Train is running on a trackside infrastructure operated with system version number  $X = 2$ , but still transmitting some balise/loop/RIU information related to system version number  $X = 1$  (see section 6.5.2)
- c) Train is running on a trackside infrastructure operated with system version number  $X = 2$ , but on-board equipment has established a communication session with a neighbouring RBC certified to system version number  $X = 1$
- d) Train is running on a trackside infrastructure operated with system version number  $X = 1$  or  $2$  and the on-board equipment has established a communication session with a RBC/RIU certified to system version number  $X.Y = 2.0$

### 6.6.2 Specific requirements for on-board operating with system version number $X = 1$

#### 6.6.2.1 Exceptions to chapter 3

6.6.2.1.1 Clause 3.12.3.4.7.2 shall be replaced with: "If the driver acknowledges before the end condition is fulfilled, the on-board equipment shall consider the driver acknowledgement as always ending the text display, regardless of the end condition defined in 3.12.3.4.3.1".

#### 6.6.2.2 Exceptions to chapter 4

6.6.2.2.1 Clause 4.4.11.1.3 d) shall be replaced with: "balise groups giving the order 'stop if in SR'. This order shall immediately trip the train."

6.6.2.2.2 Condition [54] in table 4.6.3 shall be replaced with: "(reception of information "stop if in Staff Responsible") AND (override is not active)".

#### 6.6.2.3 Exceptions to chapter 5

6.6.2.3.1 Void

#### 6.6.2.4 Exceptions to chapter 7, 8

6.6.2.4.1 Void

### 6.6.3 Handling of air gap data related to system version number $X = 1$

#### 6.6.3.1 General

6.6.3.1.1 For information received from trackside, the message consistency check shall be achieved taking into account the exceptions to chapters 7 and 8, as described in sections 6.5.1.5 and 6.5.1.6.

6.6.3.1.2 For information received from trackside, the ERTMS/ETCS on-board equipment shall use the translation tables defined here below, in order to use the information as if it had been elaborated in compliance with the current chapters 7 and 8.

**6.6.3.2 Packets received from balise, loop, RIU, RBC**

6.6.3.2.1 In the table below, the translation of information may depend on the on-board operated system version at the time the information is received and accepted on-board.

6.6.3.2.2 When a level transition or an RBC/RBC handover is announced, the information stored on-board in the transition buffer shall be translated according to system version operated on-board at the time the information is released from the transition buffer (i.e. the system version operated by the trackside infrastructure, towards which the train is running).

6.6.3.2.3 Depending on the packet, the action can be:

- a) data is unchanged,
- b) data is rejected,
- c) data is translated,
- d) not relevant

R = Rejected    T = Translated    U = Unchanged    NR = Not relevant

Received information		Action	
Packet Number	Packet Name	Operated system version number X = 1	Operated system version number X = 2
2	System Version Order	U	U
3	National Values	T [1a] [2]	T [1b] [2]
5	Linking	U	U
6	Virtual Balise Cover order	U	U
12	Level 1 Movement Authority	U	U
15	Level 2/3 Movement Authority	U	U
16	Repositioning Information	U	U
21	Gradient Profile	U	U

Received information		Action	
Packet Number	Packet Name	Operated system version number X = 1	Operated system version number X = 2
27	International Static Speed Profile	U [3]	U [3]
39	Track Condition Change of traction system	T [13]	T [13]
41	Level Transition Order	U	U
42	Session Management	U	U
44	Data used by applications outside the ERTMS/ETCS system.	U	U
45	Radio Network registration	U	U
46	Conditional Level Transition Order	U	U
49	List of balises for SH Area	U	U
51	Axle load Speed Profile	T [4][5]	T [4][5]
57	Movement Authority Request Parameters	U	U
58	Position Report Parameters	U	U
63	List of Balises in SR Authority	U	U
65	Temporary Speed Restriction	U	U
66	Temporary Speed Restriction Revocation	U	U
67	Track Condition Big Metal Masses	U	U
68	Track Condition	U [8] [9]	U [8] [9]
70	Route Suitability Data	R [11] [12]	R [11] [12]
71	Adhesion Factor	U	U
72	Packet for sending plain text messages	U [6]	U [6]
76	Packet for sending fixed text messages	R	R
79	Geographical Position Information	U [14]	U [14]
80	Mode profile	T [7]	T [7]
90	Track Ahead Free up to level 2/3 transition location	U	U
131	RBC transition order	U	U
132	Danger for Shunting information	U	U
133	Radio infill area information	U	U
134	EOLM Packet	U	U
135	Stop Shunting on desk opening	U	U
136	Infill location reference	U	U

Received information		Action	
Packet Number	Packet Name	Operated system version number X = 1	Operated system version number X = 2
137	Stop if in Staff Responsible	U	U
138	Reversing area information	U	U
139	Reversing supervision information	U	U
140	Train running number from RBC	T [10]	T [10]
141	Default Gradient for Temporary Speed Restriction	U	U
145	Inhibition of balise group message consistency reaction	U	U
200	Virtual Balise Cover marker	T [15]	T [15]
203	National Values for braking curves	T [16]	T [16]
206	Track Condition	T [17]	T [17]
207	Route Suitability Data	T [18]	T [18]
239	Track Condition Change of traction system	T [19]	T [19]
254	Default balise, loop or RIU information	U	U

[1a] The National Values Q\_NVLOCACC, V\_NVLIMSUPERV (introduced in system version number X = 2) shall be set to their respective default value

[1b] The National Values Q\_NVLOCACC, V\_NVLIMSUPERV (introduced in system version number X = 2), if already stored on-board and applicable, shall not be affected by the content of the packet 3 (i.e. if these National Values were already applicable and 2<sup>nd</sup> bullet of clause 3.18.2.5 is not applied, they shall remain applicable with their country identifier(s) previously stored).

[2] If the packet 203 is not received in the same message, the National Values for braking curves Q\_NVGUIPERM, Q\_NVSBFBPERM, Q\_NVINHSMICPERM, M\_NVAVADH, M\_NVEBCL, A\_NVP12, A\_NVP23, V\_NVKVINT, M\_NVKVINT, L\_NVKRINT, M\_NVKRINT, M\_NVKTINT, A\_NVMAXREDADH1, A\_NVMAXREDADH2, A\_NVMAXREDADH3 (introduced in system version number X.Y = 1.1), if already stored on-board and applicable, shall not be affected by the content of the packet 3 (i.e. if the National Values for braking curves were already applicable and 2<sup>nd</sup> bullet of clause 3.18.2.5 is not applied, they shall remain applicable with their country identifier(s) previously stored).

[3] Exception: if N\_ITER (following Q\_FRONT) ≠ 0, the variables Q\_DIFF, NC\_CDDIFF (introduced in system version number X = 2) and NC\_DIFF (as specified in system version number X = 2) shall be set according to the following table:

Value received from X = 1 trackside	Translated values on-board		
NC_DIFF	Q_DIFF	NC_CDDIFF	NC_DIFF
0	0	9	-

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1	0	0	-
2	0	1	-
3	0	2	-
4	0	3	-
5	0	4	-
6	0	5	-
7	0	7	-
8	0	10	-
9	1	-	0
10	1	-	1
11	1	-	2
12	0	8	-
13	0	6	-

[4] If Q\_TRACKINIT = 1, D\_TRACKINIT (introduced in system version number X = 2) shall be set to 0

[5] The variable M\_AXLELOADCAT (introduced in system version number X = 2) shall be set according to the following table:

Value received from X = 1 trackside	Translated value on-board
M_AXLELOAD	M_AXLELOADCAT
$M\_AXLELOAD \leq 16 \text{ t}$	A
$16 \text{ t} < M\_AXLELOAD \leq 17 \text{ t}$	HS17
$17 \text{ t} < M\_AXLELOAD \leq 18 \text{ t}$	B1
$18 \text{ t} < M\_AXLELOAD \leq 20 \text{ t}$	C2
$20 \text{ t} < M\_AXLELOAD \leq 22.5 \text{ t}$	D2
$22.5 \text{ t} < M\_AXLELOAD \leq 40 \text{ t}$ or M_AXLELOAD = "Axle load above 40 t"	E4

[6] Exception: if Q\_TEXTCONFIRM  $\neq$  0, then Q\_CONFTEXTDISPLAY and Q\_TEXTREPORT (introduced in system version number X = 2) shall be set to 0

[7] The variable Q\_MAMODE (introduced in system version number X = 2) shall be set to 1

[8] Exception: If the packet 206 is not received in the same message and if M\_TRACKCOND = 1 or 2, then M\_TRACKCOND (modified in system version number X = 2) shall be set to 0

[9] Exception: If the packet 206 is received in the same message, the ERTMS/ETCS on-board shall ignore the packet 68.

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[10] Within the 8 digits of the variable NID\_OPERATIONAL (as specified in system version X = 1), any digit coded as "F" shall be rightmost shifted, in order to obtain a variable NID\_OPERATIONAL (as specified in system version X = 2) made of the significant digits leftmost adjusted followed by digits coded as "F".

[11] Exception: If the packet 207 is not received in the same message and if Q\_TRACKINIT = 1, the packet shall not be rejected.

[12] Exception: If the packet 207 is not received in the same message and if the value "10" of the variable Q\_SUITABILITY is used with M\_TRACTION equal to one of the values that are listed in the translation table [13], the variables M\_VOLTAGE and NID\_CTRACTION (introduced in system version X.Y = 1.1) shall be set according to the translation table [13]. The ERTMS/ETCS on-board shall ignore any other route suitability information not related to the traction system

[13] If the packet 239 is received in the same message or if M\_TRACTION is not equal to one of the values that are listed here below, the ERTMS/ETCS on-board shall ignore the packet 39. If the packet 239 is not received in the same message and if M\_TRACTION is equal to one of the values that are listed here below the variables M\_VOLTAGE and NID\_CTRACTION shall be set according to the following table:

Value received from X = 1 trackside	Translated values on-board	
	M_VOLTAGE	NID_CTRACTION
0	0	-
1	3	10
2	1	12
3	1	13
5	4	14
6	4	1
7	1	2
8	1	3
11	2	19
12	2	20
13	2	21
15	2	22
26	1	11
31	1	18
32	3	15
33	3	16
34	1	17
41	2	4
42	2	5
43	2	6



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44	2	7
45	2	8
46	2	9

[14] Exception: if M\_POSITION = 1'048'575, then M\_POSITION (modified in system version number X = 2) shall be set to 16'777'215

[15] The variable NID\_PACKET shall be set to 0 and both the variables Q\_DIR and L\_PACKET shall be deleted

[16] The National Values included in the packet 203 shall be appended to the packet 3 received in the same message, in order to form a single set of National Values, to which apply the distance to start of validity and the list of national area identifiers given in the packet 3.

[17] The variable NID\_PACKET shall be set to 68.

[18] The variable NID\_PACKET shall be set to 70

[19] The variable NID\_PACKET shall be set to 39

**6.6.3.3 Messages received from RBC/RIU**

6.6.3.3.1 This section applies for the parts of radio messages, excluding the packets themselves, which are received from an RBC/RIU certified to the system version number X = 1.

6.6.3.3.2 Depending on the received message, the action can be:

- a) data is unchanged,
- b) data is rejected
- c) data is translated,
- d) not relevant

R = Rejected      T = Translated      U = Unchanged      NR = Not relevant

Message Number	Message Name	Action
2	SR Authorisation	U
3	Movement Authority	U
6	Recognition of exit from TRIP mode	U
8	Acknowledgement of Train Data	U
9	Request to Shorten MA	U
15	Conditional Emergency Stop	T [1]

Message Number	Message Name	Action
16	Unconditional Emergency Stop	U
18	Revocation of Emergency Stop	U
24	General message	U
27	SH Refused	U
28	SH Authorised	U
33	MA with Shifted Location Reference	U
34	Track Ahead Free Request	T [1]
37	Infill MA	U
40	Train Rejected	U [2]
32	RBC/RIU system version	U
39	Acknowledgement of termination of a communication session	U
41	Train Accepted	U [2]
43	SoM position report confirmed by RBC	U
45	Assignment of coordinate system	U

[1] Variable D\_REF (introduced in system version number X = 2) shall be set to 0

[2] Exception: if the variable NID\_LRBG  $\neq$  16777215, it shall be set to 16777215, i.e. the message shall be considered as having been received with NID\_LRBG = 16777215.

Note: An RBC X=1 based on an older version of the specification may use a value different from 16777215 for NID\_LRBG in message 40 or 41.

#### 6.6.3.4 Messages transmitted to RBC/RIU

6.6.3.4.1 This section applies for radio messages/packets, which are transmitted to an RBC or an RIU certified to the system version number X = 1.

6.6.3.4.1.1 Clause 3.5.3.7 d) 1<sup>st</sup> bullet shall be replaced with: "If one of its supported system versions is compatible with the one sent by trackside, it shall send a session established report, including its telephone numbers, to the trackside."

6.6.3.4.1.2 Clause 3.12.3.5.2 shall not apply.

6.6.3.4.2 Clause 3.18.4.5.4 shall be replaced with: "Only if valid Train Data is available: following any entry/modification of the train running number when a communication session is already established or following the successful establishment of a communication session when valid train running number is already available, the ERTMS/ETCS on-board equipment shall send the Train Data to the RBC."

6.6.3.4.3 Clause 3.18.4.5.4.1 shall be replaced with: “Exception: if the train running number has been received from the RBC, the Train Data shall not be sent back to the RBC by the ERTMS/ETCS on-board equipment.

6.6.3.4.4 The ERTMS/ETCS on-board equipment shall elaborate the information to be transmitted to the RBC/RIU certified to system version number X = 1, by applying the following translation table to the corresponding information intended for an RBC/RIU certified to the system version number X.Y = 2.1.

6.6.3.4.5 Depending on the transmitted message/packet, the action can be:

- a) data is unchanged,
- b) data is deleted (i.e. it is not sent to the receiver)
- c) data is translated,
- d) not relevant (i.e. no corresponding requirement to trigger the sending is applicable)

D = Deleted          T = Translated          U = Unchanged          NR = Not relevant

Mess nb <sub>pck</sub> nb	Message name/packet name	Action
XXX <sub>0</sub>	Position Report	U [1]
XXX <sub>1</sub>	Position Report based on two balise groups	U [1]
159 <sub>2</sub>	On-board supported system versions	T[6]
XXX <sub>4</sub>	Error Reporting	U [2]
XXX <sub>5</sub>	Train Running Number	NR
132 <sub>9</sub>	Level 2/3 transition information	U
129 <sub>11</sub>	Validated Train Data (packet)	T [3]
129	Validated Train Data (message)	U
130	Request for Shunting	U
132	MA Request	T [4]
136	Train Position Report	U
137	Request to shorten MA is granted	U
138	Request to shorten MA is rejected	U
146	Acknowledgement	U
147	Acknowledgement of Emergency Stop	T [5]
149	Track Ahead Free Granted	U
150	End of Mission	U

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Mess nb <sub>pck</sub> nb	Message name/packet name	Action
153	Radio infill request	U
154	No compatible version supported	U
155	Initiation of a communication session	U
156	Termination of a communication session	U
157	SoM Position Report	U
158	Text message acknowledged by driver	NR
159	Session Established	U

[1] Exception: if M\_MODE (X=2) = 15 (PS), then M\_MODE (X=1) = 3 (SH)

Note: if M\_MODE (X=2) = 12 (LS), no translation is effected

[2] Exceptions: if M\_ERROR (X=2) = 6, then M\_ERROR (X=1) = 7; if M\_ERROR (X=2) = 7 or 8, then the packet shall be deleted

[3] the packet 11 shall be translated as follows:

<b>Description</b>	Validated train data.		
<b>Transmitted to</b>	RBC		
<b>Content</b>	<b>Variable</b>	<b>Length</b>	<b>Comment</b>
	NID_PACKET	8	
	L_PACKET	13	
	NID_OPERATIONAL	32	See translation [3a]
	NC_TRAIN	15	See translation [3b]
	L_TRAIN	12	
	V_MAXTRAIN	7	
	M_LOADINGGAUGE	8	See translation [3c]
	M_AXLELOAD	7	See translation [3d]
	M_AIRTIGHT	2	
	N_ITER	5	See translation [3e]
	N_ITER	5	
NID_NTC (k)	8	Type of National System available	

[3a] NID\_OPERATIONAL shall be set to the value stored on-board

[3b] NC\_TRAIN shall be set according to the following table:

Value stored on-board	Transmitted value to X=1 RBC
NC_CDTRAIN	NC_TRAIN

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0	xxx xxxx xxxx xx1x
1	xxx xxxx xxxx x1xx
2	xxx xxxx xxxx 1xxx
3	xxx xxxx xxx1 xxxx
4	xxx xxxx xx1x xxxx
5	xxx xxxx x1xx xxxx
6	x1x xxxx xxxx xxxx
7	xxx xxxx 1xxx xxxx
8	xx1 xxxx xxxx xxxx
9	xxx xxxx xxxx xxx1
10	xxx xxx1 xxxx xxxx
NC_TRAIN	
000 0000 0000 0000	No bit is set to 1
xxx xxxx xxxx xxx1	xxx xx1x xxxx xxxx
xxx xxxx xxxx xx1x	xxx x1xx xxxx xxxx
xxx xxxx xxxx x1xx	xxx 1xxx xxxx xxxx
Other values	No bit is set to 1

[3c] M\_LOADINGGAUGE shall be set to 0

[3d] M\_AXLELOAD shall be set according to the following table:

Value stored on-board	Transmitted value to X=1 RBC
A	16 t
HS17	17 t
B1	18 t
B2	18 t
C2	20 t
C3	20 t
C4	20 t
D2	22,5 t
D3	22,5 t
D4	22,5 t
D4xL	22,5 t
E4	25 t

E5	25 t
----	------

[3e] N\_ITER shall be set to 0

[4] Q\_MARQSTREASON shall be replaced with Q\_TRACKDEL (1 bit) as follows: if Q\_MARQSTREASON = x1xxx, Q\_TRACKDEL shall be set to 1, otherwise Q\_TRACKDEL shall be set to 0

[5] The variable Q\_EMERGENCYSTOP (modified in system version number X = 2) shall be set according to the following table:

Value that would be transmitted to X=2 RBC	Transmitted value to X=1 RBC
Q_EMERGENCYSTOP	Q_EMERGENCYSTOP
0	0
1	0
2	2
3	1

[6] the packet 2 shall be replaced with the following packet numbered as 3:

<b>Description</b>	Telephone numbers associated to the onboard equipment		
<b>Transmitted to</b>	RBC, RIU		
<b>Content</b>	<b>Variable</b>	<b>Length</b>	<b>Comment</b>
	NID_PACKET	8	=3
	L_PACKET	13	
	N_ITER	5	
	NID_RADIO (k)	64	

#### 6.6.4 Handling of air gap data related to system version number X.Y = 2.0

##### 6.6.4.1 Messages transmitted to RBC/RIU

6.6.4.1.1 This section applies for radio messages/packets, which are transmitted to an RBC or an RIU certified to the system version number X.Y = 2.0.

6.6.4.1.2 The clause 6.6.3.4.1.1 and the translation [6] referred to in clause 6.6.3.4.5 shall apply.