

Making the railway system
work better for society.

ERTMS OPERATIONAL PRINCIPLES AND RULES – version [56](#)

1. AMENDMENT RECORD

<i>Version</i>	<i>Date</i>	<i>Comments</i>
1.0	01/02/2008	First version
2.0	23/07/2012	ETCS version 2.3.0d
3.0	02/12/2013	ETCS version 3.3.0 / GSM-R Emergency call
4.0	30/06/2015	Transfer of operational rules from Appendix A to Appendix B
5.0	09/04/2019	ETCS versions 3.4.0 and 3.6.0 / Introduction of ERTMS Marker Boards
5.01	30/09/2020	Proposals for harmonisation (batch 1)
5.02	25/10/2020	Minor additional amendments
5.03	18/02/2021	Proposals for harmonisation (batch 2)
5.04	05/05/2021	Consolidated version (batch 1 & 2, ATO)
5.05	18/05/2021	Integrating feedback from OH #76bis meetings
5.06	16/09/2021	Further review from OH group
5.07	18/11/2021	Proposals for Level 3, further improvements
5.08	8/2/2022	Consolidated version after OH #79
5.09	1/3/2022	Cleaned-up ver. 5.08 without rejected alternatives and comments
5.10	13/5/2022	Introduction of Level R, CR 1389, new harmonised marker boards
5.11	20/5/2022	Further review from OH group, consolidated version after OH #80
5.12	24/6/2022	Feedback from OH review and from public consultation, minor additional changes, update of Annex C
6.0	XX/XX/202X	ETCS system version 2.2

2. TABLE OF CONTENTS

<u>1. AMENDMENT RECORD</u>	<u>2</u>
<u>2. TABLE OF CONTENTS</u>	<u>3</u>
<u>3. INTRODUCTION.....</u>	<u>12</u>
<u>3.1 PURPOSE AND STRUCTURE OF THE DOCUMENT.....</u>	<u>12</u>
<u>3.2 SCOPE AND FIELD OF APPLICATION</u>	<u>13</u>
<u>4. REFERENCES, TERMS AND ABBREVIATIONS</u>	<u>15</u>
<u>4.1 REFERENCE DOCUMENTS.....</u>	<u>15</u>
<u>4.2 TERMS & ABBREVIATIONS</u>	<u>15</u>
<u>5. PRINCIPLES.....</u>	<u>22</u>
<u>5.1 PRINCIPLES FOR ETCS</u>	<u>22</u>
<u>5.1.1 CAB-SIGNALLING.....</u>	<u>22</u>
<u>5.1.2 KNOWLEDGE OF OPERATING LEVEL.....</u>	<u>22</u>
<u>5.1.3 INTENTIONALLY BLANK</u>	<u>22</u>
<u>5.1.4 INTENTIONALLY BLANK</u>	<u>22</u>
<u>5.1.5 INTENTIONALLY BLANK</u>	<u>22</u>
<u>5.1.6 AUTHORISATION TO START A MOVEMENT IN SR.....</u>	<u>22</u>
<u>5.1.7 SPEED RESTRICTIONS IN SR.....</u>	<u>23</u>
<u>5.1.8 AUTHORISATION TO PASS AN EOA.....</u>	<u>23</u>
<u>5.1.9 TRAINS / SHUNTING MOVEMENTS BEING TRIPPED</u>	<u>23</u>
<u>5.1.10 ETCS STOP MARKER</u>	<u>23</u>
<u>5.1.11 ETCS LOCATION MARKER.....</u>	<u>23</u>
<u>5.2 INTENTIONALLY BLANK</u>	<u>24</u>
<u>6. ETCS OPERATIONAL RULES</u>	<u>25</u>
<u>6.1 PUTTING THE ETCS ON-BOARD INTO SERVICE.....</u>	<u>25</u>
<u>6.1.1 Entering data during start of mission.....</u>	<u>25</u>
<u>6.1.2 Manual change of data</u>	<u>25</u>
<u>6.2 PREPARING A MOVEMENT</u>	<u>25</u>
<u>6.2.1 The traction unit has to move as a train</u>	<u>26</u>
<u>6.2.2 The traction unit has to move in SH</u>	<u>26</u>
<u>6.2.3 The traction unit has to move in NL.....</u>	<u>26</u>
<u>6.2.4 The traction unit has to move as a train and an acknowledgement for SR is requested</u>	<u>26</u>
<u>6.2.5 The traction unit has to move in SL.....</u>	<u>27</u>
<u>6.3 PERFORMING SHUNTING MOVEMENTS IN SH.....</u>	<u>28</u>
<u>6.3.1 Manual entry into SH</u>	<u>28</u>
<u>6.3.2 Automatic entry into SH</u>	<u>28</u>
<u>6.3.3 Running in SH</u>	<u>28</u>

6.3.4	Maintain SH when changing the cab.....	28
6.3.5	Exit from SH	29
6.3.6	SH not granted	29
6.3.7	Passing a defined border of a shunting area.....	29
6.4	ENTERING TRAIN DATA	30
6.4.1	Entering train data during train preparation	30
6.4.2	Manual change of train data.....	30
6.4.3	Change of train data by ETCS external sources	31
6.5	INTENTIONALLY BLANK	31
6.6	INTENTIONALLY BLANK	31
6.7	ENTERING AND OPERATING IN ETCS LEVEL 0	32
6.7.1	Announcement	32
6.7.2	Acknowledgement	32
6.7.3	Running	32
6.8	ENTERING AND OPERATING IN ETCS LEVEL 1	33
6.8.1	Announcement	33
6.8.2	Acknowledgement	33
6.8.3	Running	33
6.9	INTENTIONALLY BLANK	34
6.10	ENTERING AND OPERATING IN ETCS LEVEL R	35
6.10.1	Announcement	35
6.10.2	Acknowledgement	35
6.10.3	Running	35
6.11	ENTERING AND OPERATING IN ETCS LEVEL NTC	36
6.11.1	Announcement	36
6.11.2	Acknowledgement	36
6.11.3	Running	36
6.12	RUNNING IN FS	37
6.13	RUNNING IN OS.....	38
6.14	RUNNING IN SR.....	39
6.15	RUNNING IN LS	40
6.16	RUNNING IN UN.....	40
6.17	RUNNING IN SN.....	41
6.18	APPROACHING AN EOA WITH A RELEASE SPEED INDICATION.....	41
6.19	MANAGING A TRACK AHEAD FREE REQUEST.....	42
6.20	PASSING A SECTION WITH LOWERED PANTOGRAPH(S).....	43
6.21	CHANGING THE ELECTRIC POWER SUPPLY	44
6.22	PASSING A SECTION WITH MAIN POWER SWITCH SWITCHED OFF	47

6.23	PASSING A NON STOPPING AREA	48
6.24	PASSING A SECTION WITH INHIBITION OF MAGNETIC SHOE BRAKE	48
6.25	PASSING A SECTION WITH INHIBITION OF EDDY CURRENT BRAKE	50
6.26	PASSING A SECTION WITH INHIBITION OF REGENERATIVE BRAKE	51
6.27	PASSING A PRESSURE SEAL SECTION	52
6.28	SOUNDING THE AUDIBLE WARNING DEVICE	52
6.29	CHANGING OF ADHESION FACTOR	54
6.30	PASSING A RADIO HOLE	54
6.31	INTENTIONALLY BLANK	54
6.32	PERFORMING A TANDEM MOVEMENT	55
6.32.1	Entry into NL	55
6.32.2	Performing the tandem movement	55
6.32.3	Exit from NL	55
6.33	REVOKING AN AUTHORISATION FOR ERTMS TRAIN MOVEMENT	56
6.33.1	A	56
6.33.1	B	56
6.33.2		56
6.34	TAKING MEASURES IN THE EVENT OF AN EMERGENCY	57
6.34.1	To protect the trains	57
6.34.2	To restart the trains	57
6.34.3	To protect and restart shunting movements	58
6.35	STOPPING IN A SAFE AREA	58
6.36	PROPELLING IN RV	60
6.36.1	Preparing the movement to be performed in RV	60
6.36.2	Running in RV	60
6.36.3	Exceeding the permitted distance in RV	61
6.36.4	Exit from RV	61
6.37	REACTING TO UNINTENTIONAL MOVEMENTS	62
6.38	MANAGING ROUTE UNSUITABILITY DETECTED BY THE ON-BOARD SYSTEM	62
6.39	AUTHORISING THE PASSING OF AN EOA	63
6.40	REACTING TO UNEXPECTED SITUATIONS WHEN PREPARING A TRAIN MOVEMENT	64
6.40.1	The traction unit has to move as a train but an acknowledgement for SH is requested	64
6.40.2	The train is rejected	64
6.41	RESPONDING TO A TRIP	65
6.41.1	Immediate measures	65
6.41.2	To restart	66
6.41.3	No movement required after a trip	67

[6.41.4 Trip in SH when passing a defined border of a shunting area 67](#)

[6.42 MANAGING AN ETCS TRACKSIDE MALFUNCTION..... 67](#)

[6.43 MANAGING INCOMPATIBILITY BETWEEN ETCS TRACKSIDE AND ETCS ON-BOARD 68](#)

[6.44 MANAGING A LEVEL CROSSING NOT PROTECTED 68](#)

[6.44.1 If in FS, OS or LS..... 68](#)

[6.44.2 If in SR..... 68](#)

[6.45 MANAGING A BALISE READ ERROR 69](#)

[6.46 MANAGING A FAILED LEVEL TRANSITION..... 70](#)

[The ETCS level transition point may be marked through the following trackside marker board: 70](#)

[6.46.1 If the train has been tripped 70](#)

[6.46.2 If in SR..... 70](#)

[6.46.3 In all other cases..... 70](#)

[6.47 MANAGING ABSENCE OF RBC INFORMATION..... 72](#)

[6.48 MANAGING A RADIO COMMUNICATION FAILURE..... 72](#)

[6.49 MANAGING A FAILURE OF SELF TEST 73](#)

[6.50 MANAGING A FAILURE AFFECTING THE ON-BOARD RADIO EQUIPMENT 73](#)

[6.50.1 During the preparation of the traction unit 73](#)

[6.50.2 While running..... 73](#)

[6.51 MANAGING A FAILED DMI 74](#)

[6.52 MANAGING A SYSTEM FAILURE..... 74](#)

[6.53 MANAGING A NTC FAILURE 74](#)

[6.54 MANAGING A VBC..... 74](#)

[6.55 RUNNING IN AD..... 75](#)

[6.55.1 Engaging ATO..... 75](#)

[6.55.2 Running in ATO 75](#)

[6.55.3 Disengaging ATO 75](#)

[6.56 MANAGING A TIMS FAILURE 77](#)

[6.57 MANAGING AN IMPAIRED ODOMETER FAILURE 77](#)

[7. GSM/R VOICE RADIO OPERATIONAL RULES 78](#)

[7.1 SELECTING THE GSM-R MODE 78](#)

[7.2 ENTERING THE FUNCTIONAL NUMBER 78](#)

[7.3 SELECTING THE GSM-R NETWORK AT A BORDER CROSSING 78](#)

[7.3.1 Inhibition of automatic network selection..... 78](#)

[7.3.2 Selection of another GSM-R network..... 78](#)

[7.4 PERFORMING A DE-REGISTRATION..... 79](#)

[7.5 INTENTIONALLY BLANK 79](#)

[7.6 MANAGING A FAILURE OF SELF TEST 79](#)

<u>7.7</u>	<u>MANAGING A LACK OF GSM-R NETWORK AFTER THE TRAIN HAS ENTERED SERVICE</u>	<u>79</u>
<u>7.8</u>	<u>INTENTIONALLY BLANK</u>	<u>79</u>
<u>7.9</u>	<u>MANAGING A FAILURE OF DE-REGISTRATION</u>	<u>79</u>
<u>7.10</u>	<u>TAKING MEASURES IN CASE THE FUNCTIONAL NUMBER IS NOT AVAILABLE ..</u>	<u>80</u>
<u>7.11</u>	<u>TAKING MEASURES IN CASE THE FUNCTIONAL NUMBER IS ALREADY USED ..</u>	<u>80</u>
<u>7.12</u>	<u>MANAGING A FAILURE WHEN REGISTERING THE FUNCTIONAL NUMBER.....</u>	<u>80</u>
<u>7.13</u>	<u>GSM-Public as primary communication (if this option is available on-board)</u>	<u>81</u>
<u>7.13.1</u>	<u>Changing-over from GSM-R to GSM-Public.....</u>	<u>81</u>
<u>7.13.2</u>	<u>Changing-over from GSM-Public to GSM-R.....</u>	<u>81</u>
<u>7.14</u>	<u>GSM-Public as fall-back communication (if this option is available on-board)</u>	<u>81</u>
<u>7.14.1</u>	<u>Changing-over from GSM-R to GSM-Public.....</u>	<u>81</u>
<u>7.14.2</u>	<u>Changing-over from GSM-Public to GSM-R.....</u>	<u>81</u>
<u>8.</u>	<u>ANNEX A - INTENTIONALLY BLANK.....</u>	<u>82</u>
<u>9.</u>	<u>ANNEX B – LIST OF ETCS OPERATIONAL TRAIN CATEGORIES</u>	<u>83</u>
<u>10.</u>	<u>ANNEX C – TABLE OF REFERENCES TO NON-HARMONISED RULES</u>	<u>84</u>
1.	AMENDMENT RECORD	2
2.	TABLE OF CONTENTS	3
3.	INTRODUCTION	8
3.1	PURPOSE AND STRUCTURE OF THE DOCUMENT	8
3.2	SCOPE AND FIELD OF APPLICATION	9
4.	REFERENCES, TERMS AND ABBREVIATIONS	10
4.1	REFERENCE DOCUMENTS	10
4.2	TERMS & ABBREVIATIONS	10
5.	PRINCIPLES	16
5.1	PRINCIPLES FOR ETCS	16
5.1.1	CAB-SIGNALLING.....	16
5.1.2	KNOWLEDGE OF OPERATING LEVEL.....	16
5.1.3	INTENTIONALLY BLANK.....	16
5.1.4	INTENTIONALLY BLANK.....	16
5.1.5	INTENTIONALLY BLANK.....	16
5.1.6	AUTHORISATION TO START A MOVEMENT IN SR.....	16
5.1.7	SPEED RESTRICTIONS IN SR	17
5.1.8	AUTHORISATION TO PASS AN EOA.....	17
5.1.9	TRAINS / SHUNTING MOVEMENTS BEING TRIPPED	17
5.1.10	ETCS STOP MARKER.....	17
5.1.11	ETCS LOCATION MARKER	17
5.2	INTENTIONALLY BLANK.....	18

6. ETCS OPERATIONAL RULES 19

6.1 PUTTING THE ETCS ON BOARD INTO SERVICE 19

6.1.1 Entering data during start of mission 19

6.1.2 Manual change of data 19

6.2 PREPARING A MOVEMENT 19

6.2.1 The traction unit has to move as a train 19

6.2.2 The traction unit has to move in SH 20

6.2.3 The traction unit has to move in NL 20

6.2.4 The traction unit has to move as a train and an acknowledgement for SR is requested 20

6.3 PERFORMING SHUNTING MOVEMENTS IN SH 22

6.3.1 Manual entry into SH 22

6.3.2 Automatic entry into SH 22

6.3.3 Running in SH 22

6.3.4 Maintain SH when changing the cab 22

6.3.5 Exit from SH 22

6.3.6 SH not granted 23

6.3.7 Passing a defined border of a shunting area 23

6.4 ENTERING TRAIN DATA 24

6.4.1 Entering train data during train preparation 24

6.4.2 Manual change of train data 24

6.4.3 Change of train data by ETCS external sources 25

6.5 INTENTIONALLY BLANK 25

6.6 INTENTIONALLY BLANK 25

6.7 ENTERING AND OPERATING IN LEVEL 0 26

6.7.1 Announcement 26

6.7.2 Acknowledgement 26

6.7.3 Running 26

6.8 ENTERING AND OPERATING IN LEVEL 1 27

6.8.1 Announcement 27

6.8.2 Acknowledgement 27

6.8.3 Running 27

6.9 ENTERING AND OPERATING IN LEVEL 2 28

6.9.1 Announcement 28

6.9.2 Acknowledgement 28

6.9.3 Running 28

6.10 ENTERING AND OPERATING IN LEVEL 3 29

6.10.1 Announcement 29

6.10.2	Acknowledgement.....	29
6.10.3	Running.....	29
6.11	ENTERING AND OPERATING IN LEVEL NTC.....	30
6.11.1	Announcement.....	30
6.11.2	Acknowledgement.....	30
6.11.3	Running.....	30
6.12	RUNNING IN FS.....	31
6.13	RUNNING IN OS.....	32
6.14	RUNNING IN SR.....	33
6.15	RUNNING IN LS.....	34
6.16	RUNNING IN UN.....	34
6.17	RUNNING IN SN.....	35
6.18	APPROACHING AN EOA WITH A RELEASE SPEED INDICATION.....	35
6.19	MANAGING A TRACK AHEAD FREE REQUEST.....	36
6.20	PASSING A SECTION WITH LOWERED PANTOGRAPH(S).....	37
6.21	CHANGING THE ELECTRIC POWER SUPPLY.....	38
6.22	PASSING A SECTION WITH MAIN POWER SWITCH SWITCHED OFF.....	39
6.23	PASSING A NON STOPPING AREA.....	40
6.24	PASSING A SECTION WITH INHIBITION OF MAGNETIC SHOE BRAKE.....	40
6.25	PASSING A SECTION WITH INHIBITION OF EDDY CURRENT BRAKE.....	41
6.26	PASSING A SECTION WITH INHIBITION OF REGENERATIVE BRAKE.....	41
6.27	PASSING A PRESSURE SEAL SECTION.....	42
6.28	SOUNDING THE AUDIBLE WARNING DEVICE.....	42
6.29	CHANGING OF ADHESION FACTOR.....	43
6.30	PASSING A RADIO HOLE.....	43
6.31	ENTERING AN OCCUPIED TRACK SECTION WITHIN A STATION.....	43
6.32	PERFORMING A TANDEM MOVEMENT.....	44
6.32.1	Entry into NL.....	44
6.32.2	Performing the tandem movement.....	44
6.32.3	Exit from NL.....	44
6.33	REVOKING AN AUTHORISATION FOR ERTMS TRAIN MOVEMENT.....	45
6.34	TAKING MEASURES IN THE EVENT OF AN EMERGENCY.....	46
6.34.1	To protect the trains.....	46
6.34.2	To restart the trains.....	46
6.34.3	To protect and restart shunting movements.....	47
6.35	STOPPING IN A SAFE AREA.....	47
6.36	PROPELLING IN RV.....	48

6.36.1	Preparing the movement to be performed in RV.....	48
6.36.2	Running in RV.....	48
6.36.3	Exceeding the permitted distance in RV.....	49
6.36.4	Exit from RV.....	49
6.37	REACTING TO UNINTENTIONAL MOVEMENTS.....	50
6.38	MANAGING ROUTE UNSUITABILITY.....	50
6.39	AUTHORISING THE PASSING OF AN EOA.....	51
6.40	REACTING TO UNEXPECTED SITUATIONS WHEN PREPARING A TRAIN MOVEMENT.....	52
6.40.1	The traction unit has to move as a train but an acknowledgement for SH is requested.....	52
6.40.2	The train is rejected.....	52
6.41	RESPONDING TO A TRIP.....	53
6.41.1	Immediate measures.....	53
6.41.2	To continue running.....	54
6.41.3	No movement required after a trip.....	55
6.41.4	Trip in SH when passing a defined border of a shunting area.....	55
6.42	MANAGING A TRACKSIDE MALFUNCTION.....	55
6.43	MANAGING INCOMPATIBILITY BETWEEN TRACKSIDE AND ETCS ON-BOARD.....	55
6.44	MANAGING A LEVEL CROSSING NOT PROTECTED.....	56
6.44.1	If in FS, OS or LS.....	56
6.44.2	If in SR.....	56
6.45	MANAGING A BALISE READ ERROR.....	56
6.46	MANAGING A FAILED LEVEL TRANSITION.....	57
6.46.1	If the train has been tripped.....	57
6.46.2	If in SR.....	57
6.46.3	In all other cases.....	57
6.47	MANAGING ABSENCE OF RBC INFORMATION.....	59
6.48	MANAGING A RADIO COMMUNICATION FAILURE.....	59
6.49	MANAGING A FAILURE OF SELF TEST.....	60
6.50	MANAGING A FAILURE AFFECTING THE ON-BOARD RADIO EQUIPMENT.....	60
6.50.1	During the preparation of the traction unit.....	60
6.50.2	While running.....	60
6.51	MANAGING A DMI WITH BLANK SCREEN.....	61
6.52	MANAGING A SYSTEM FAILURE.....	61
6.53	MANAGING A NTC FAILURE.....	61
6.54	MANAGING A VBC.....	61
7.	GSM/R VOICE RADIO OPERATIONAL RULES.....	62
7.1	SELECTING THE GSM R MODE.....	62

7.2	ENTERING THE FUNCTIONAL NUMBER	62
7.3	SELECTING THE GSM-R NETWORK AT A BORDER CROSSING	62
7.3.1	Inhibition of automatic network selection	62
7.3.2	Selection of another GSM-R network	62
7.4	PERFORMING A DE-REGISTRATION	63
7.5	INTENTIONALLY BLANK	63
7.6	MANAGING A FAILURE OF SELF TEST	63
7.7	MANAGING A LACK OF GSM-R NETWORK AFTER THE TRAIN HAS ENTERED SERVICE	63
7.8	INTENTIONALLY BLANK	63
7.9	MANAGING A FAILURE OF DE-REGISTRATION	63
7.10	TAKING MEASURES IN CASE THE FUNCTIONAL NUMBER IS NOT AVAILABLE	64
7.11	TAKING MEASURES IN CASE THE FUNCTIONAL NUMBER IS ALREADY USED	64
7.12	MANAGING A FAILURE WHEN REGISTERING THE FUNCTIONAL NUMBER	64
7.13	GSM-Public as primary communication (if this option is available onboard)	65
7.13.1	Changing-over from GSM-R to GSM-Public	65
7.13.2	Changing-over from GSM-Public to GSM-R	65
7.14	GSM-Public as fall-back communication (if this option is available onboard)	65
7.14.1	Changing-over from GSM-R to GSM-Public	65
7.14.2	Changing-over from GSM-Public to GSM-R	65
8.	ANNEX A - INTENTIONALLY BLANK	66
9.	ANNEX B - LIST OF ETCS OPERATIONAL TRAIN CATEGORIES	67
10.	ANNEX C - TABLE OF REFERENCES TO NON-HARMONISED RULES	68

3. INTRODUCTION

3.1 PURPOSE AND STRUCTURE OF THE DOCUMENT

This document contains the principles and harmonised rules for the operation of ERTMS.

The structure of each rule is the following:

- title,
- when necessary, situations in which the rule applies, presented in a frame, including the applicable ETCS levels; sometimes the situation is described for some specific sub-sections of the rules,
- the rule itself.

When this document refers to [ETCS](#) level 1 it applies to both applications, with or without trackside signals, unless otherwise stated.

When this document refers to [ETCS](#) level ~~2~~-R it applies to both applications, with or without trackside signals, unless otherwise stated.

[The European Instructions referenced in this document are listed under Appendix C2 to the OPE TSI.](#)

All language referring to people applies equally to male and female persons.

Annex A is intentionally blank.

Annex B contains the different ETCS operational train categories.

Annex C contains the list of references to non-harmonised rules. In some situations a procedure is not related to ERTMS and therefore depends on non-harmonised rules.

The description of the technical functions for ETCS and GSM-R is contained in the corresponding system requirements specification and therefore out of scope for this document.

If information displayed on the DMI does not require an action from the driver this information is not contained in the rules.

3.2 SCOPE AND FIELD OF APPLICATION

The document is fully applicable to ETCS ~~Onboard~~On-board units complying with the single set Set of specifications ~~#2 or Set of specifications #3~~ of Commission Regulation ~~2016/919~~2023/XXXX with an operated system version X.Y up to and including 2.2. It is also applicable to On-board units complying with Set of specifications #2 or Set of specifications #3 and largely applicable to ETCS ~~Onboard~~On-board units complying with Set of specifications #1 of Commission Regulation 2016/919, provided that the DMI used fulfills the specification ERA_ERTMS_015560.

For On-board units complying with any of the sets of specifications under Commission Regulation 2016/919, sections of this document referring to Level R(adio) will apply whenever Level 2 or Level 3 is indicated on the DMI.

The document also applies to operational processes of IMs with trackside systems complying with any of the sets of specifications under Commission Regulation 2016/919, by replacing “Level R” by “Level 2” in all sections.

The scope is the following:

- ETCS level 0 application,
- ETCS level 1 application whether or not trackside signals or infill are present,
- ETCS level 2-R application, whether or not trackside signals are present,
- ~~ETCS level 3 application without trackside signals,~~
- ETCS transitions between level 0, level 1, ~~level 2~~ and level 3R applications,
- ETCS level NTC application
- ETCS transitions to / from level NTC,
- GSM-R.

The following items are out of scope:

- Class B systems (even when operated through the ETCS DMI)

The rules have been developed independently of other control command systems that may be present including where lines are equipped with ETCS level 1 / ~~2/3R~~.

When ETCS level 1 or ETCS level 2-R are implemented on lines fitted with other control command systems it is necessary to assess the applicability of these rules and if necessary supplement them with non-harmonised rules. This includes those lines fitted with both ETCS level 1 and ETCS level 2R.

GSM-R voice radio operational rules are applicable on lines equipped with GSM-R independently of the control command system in use. Conversely, ETCS operational rules are applicable on lines equipped with ETCS independently of the voice radio system in use.

The applicability of the rules further depends on the engineering solutions adopted by the ERTMS trackside subsystem. In this context, some rules may not need to apply if the relevant functions are not implemented trackside (e.g. when track conditions are not transmitted or the level

crossing procedure is not implemented); yet when a rule needs to apply, it will always do so in the way described in this document.

All actions involving the driver assume his physical presence in the driver's cab, unless when required to examine a technical failure of the train at standstill, or obtain signaller's instructions through a fixed lineside phone or when requested by the signaller or non-harmonised rules.

Throughout this document, the ETCS On-board unit is assumed to be powered on if not otherwise stated. The desk of the active driving cab is assumed to be open unless otherwise stated.

An End of Authority (EoA) can be physically identified by means of an ETCS Stop Marker or an ETCS Location Marker. The EoA can also be identified by a lineside signal or other marker board with a stop indication. Under certain conditions, an EoA can also be at the train's front end.

4. REFERENCES, TERMS AND ABBREVIATIONS

4.1 REFERENCE DOCUMENTS

Table 1 : reference documents

Ref. N°	Document Reference	Title
[1]	Annex Appendix A of the CCS TSI	Commission Regulation (EU) 2016/919 2023/XXX
[2]	EN 16494/2015	Railway applications – Requirements for ERTMS Trackside Boards

4.2 TERMS & ABBREVIATIONS

Table 2 : Terms*

Term	Definition
Acknowledgement	Confirmation given by the driver to a request from the ETCS on-board that he has received information he needs to take into account.
Applicable speed limit (in SR)	The lowest speed limit of: <ul style="list-style-type: none"> • maximum speed for SR, • maximum train speed, • timetable / Route Book, • temporary speed restrictions (transmitted by other means than operational instruction), • operational instruction.
Authorisation for ERTMS train movement	Permission for a train to move given by means of: <ul style="list-style-type: none"> • a trackside signal at proceed aspect or, • an MA or, • a European Instruction: <ul style="list-style-type: none"> ○ to start in SR after preparing a train movement or, ○ to pass an-EOA or stop signal or, ○ to proceed after train-trip.
Border crossing	Location where trains cross from a railway network in one Member State to a railway network in another Member State.

Table 2 : Terms*

Term	Definition
De-registration	Termination of the temporary relationship between the telephone number and the train running number. This action can be initiated by the user of a GSM-R radio, by automatic systems or by the network authority. The de-registration allows the de-registered train running number to be re-used.
Driver Machine Interface (DMI)	Train device to enable communication between the ETCS on-board and the driver.
Emergency propelling area	Area where propelling movements in RV are allowed.
Emergency stop order	ETCS order braking a train with the maximum brake force until the train is at a standstill.
End Of Authority (EOA)	Location to which an ETCS train is authorised to proceed and where the target speed is zero.
ETCS location marker	Harmonised trackside ETCS signal <u>marker board</u> defined in [2] used to identify a potential EOA, e.g. the end of a block section.
ETCS on-board	The part of ETCS installed on a railway vehicle.
ETCS stop marker	Harmonised trackside ETCS signal <u>marker board</u> defined in [2] used to: <ul style="list-style-type: none"> • identify a potential EOA and, • indicate the location where <u>a driver has to stop the train, if running without an MA</u> a train running without an MA has to stop.
ETCS operational train category	Set of technical and / or operational characteristics of a train to which a specific ETCS speed profile applies.

Table 2 : Terms*

Term	Definition
Functional number (GSM-R)	<p>Full number used within the functional addressing scheme to identify an end user or a system by function or role rather than by a specific item of radio equipment or user subscription.</p> <p>The functional number can be divided into two parts:</p> <ul style="list-style-type: none"> • functional addressing (process of addressing a call using a specific number, representing the function a user is performing, rather than a number identifying the GSM-R on-board), • location dependent addressing (process of addressing a particular function – typically a signaller – based on the current location of the user – typically a train).
GSM-R mode	<p>Status of the GSM-R on-board which provides functions for:</p> <ul style="list-style-type: none"> • train movement, • or shunting movement.
GSM-R network	Radio network which provides GSM-R functions.
GSM-R network marker	Harmonised trackside GSM-R signal defined in [2] to indicate the network to be selected.
GSM-R on-board	The part of GSM-R installed on a railway vehicle.
Maximum speed for RV	Maximum speed given from the ETCS trackside in RV.
Maximum speed for SR	Maximum speed given from the ETCS trackside in SR.
Movement Authority (MA)	Permission for a train to move to a specific location with supervision of speed.
Non stopping area	Area defined by the Infrastructure Manager where it may not be safe or suitable to stop a train.
Override EOA speed	Maximum speed when the override EOA function is active.

Table 2 : Terms*

Term	Definition
Permitted speed	Maximum speed at which a train / shunting movement can run without ETCS warning and / or brake intervention.
Proceed aspect	Any signal aspect which permits the driver to pass the signal.
Propelling	Movement of a train where the driver is not in the leading cab of the leading vehicle.
Radio communication	Exchange of information between the ETCS on-board and the RBC / radio infill unit.
Radio Block Centre (RBC)	ETCS trackside centralised unit controlling ETCS train movements in level 2 3 <u>R</u> .
Radio hole	A pre-defined area where it is not possible to establish a reliable radio communication channel.
Registration	Temporary relationship between the telephone number and the train running number.
Release speed	Maximum speed at which a train is allowed to reach the end of its Movement Authority.
Revocation of MA	Withdrawal of a previous given MA.
Route Book	Description of the lines and the associated line-side equipment for the lines over which the driver will operate and relevant to the driving task.
Securing	Measures to be applied to avoid unintentional movement of railway vehicles.
Shunting movement	Way of moving vehicles without train data and controlled by shunting orders.

Table 2 : Terms*

Term	Definition
Tandem	Two or more traction units mechanically and pneumatically coupled but not all remote controlled and where each traction unit not remote controlled requires a driver.
Temporary speed restriction	Reduction of the line speed for a limited period of time.
Text message	Information in writing displayed on the DMI.
Train data	Information which describes the characteristics of a train.
Train preparer	Performer Staff in charge of the preparation of a train.
Transition	Controlled change between the different ETCS levels.
Transition point	Point where a transition between ETCS levels takes place.
Trip	Irrevocable application of the emergency brakes by ETCS until the train / shunting movement is at a standstill.

Table 3 : Abbreviations*

Abbreviation	Definition
AD	Automatic Driving mode
ATO	Automated Train Operation
DAS	Driver Advisory System
DMI	Driver Machine Interface
EOA	End Of Authority
ERTMS	European Rail Traffic Management System
ETCS	European Train Control System
FS	Full Supervision mode
G	Goods train braking mode
GSM-R	Global System for Mobile communication - Railway
IM	Infrastructure Manager
LS	Limited Supervision mode
MA	Movement Authority
NL	Non Leading mode
NTC	National Train Control system
OS	On Sight mode
P	Passenger train braking mode
RBC	Radio Block Centre
REC	Radio Emergency Call
RU	Railway Undertaking
RV	Reversing mode
SH	Shunting mode

Table 3 : Abbreviations*

Abbreviation	Definition
SL	Sleeping mode
SN	National System
SR	Staff Responsible mode
STM	Specific Transmission Module
TIMS	Train Integrity Monitoring System
UN	Unfitted mode
VBC	Virtual Balise Cover

* For a complete list of ERTMS terms and abbreviations refer to Subset 023 “Glossary of Terms and Abbreviations” under Appendix A of Commission Regulation (EU) 2023/XXXX.

5. PRINCIPLES

5.1 PRINCIPLES FOR ETCS

5.1.1 CAB-SIGNALLING

The driver shall observe the displayed information on the DMI and shall react as required by the operational rules.

The [ETCS](#) operational rules (including non-harmonised rules listed in annex C) could require ~~him~~ [the driver](#) to take into account [the harmonised marker boards defined in \[2\] as well as other non-harmonised](#) trackside information.

5.1.2 KNOWLEDGE OF OPERATING LEVEL

Before applying an ETCS rule that is particular to a specific operating [ETCS](#) level, the signaller shall ascertain what [ETCS](#) level the concerned train is operating in.

5.1.3 INTENTIONALLY BLANK

5.1.4 INTENTIONALLY BLANK

5.1.5 INTENTIONALLY BLANK

5.1.6 AUTHORISATION TO START A MOVEMENT IN SR

The driver shall be authorised by the signaller to start a movement in SR by means of an operational instruction, except in case of starting a movement in [ETCS](#) level 1 / ~~2-R~~ with trackside signals.

When the protection of the danger point is not guaranteed, Member States may require that the route book should provide that an authorisation of the signaller is required.

5.1.7 SPEED RESTRICTIONS IN SR

The signaller shall give all speed restrictions lower than the maximum speed for SR to the driver of a train running in SR by means of an operational instruction except if the driver is informed by a dedicated document/computer medium about these speed limitations.

5.1.8 AUTHORISATION TO PASS AN EOA

The driver shall only be authorised to pass an EOA by the signaller by means of an operational instruction.

5.1.9 TRAINS / SHUNTING MOVEMENTS BEING TRIPPED

After a trip has occurred, the driver shall ~~continue running~~[restart](#) in the ~~same initial or opposite~~ direction only if he has received permission by operational instruction from the signaller.

5.1.10 ETCS STOP MARKER

The driver shall stop on the approach to an ETCS Stop Marker:

- indicating the EOA of the current MA, or
- when running without an MA unless he has received a specific authorisation by the signaller.

5.1.11 ETCS LOCATION MARKER

The driver shall stop on the approach to a ETCS Location Marker:

- indicating the EOA of the current MA, or
- when running without an MA if he has received a specific order by the signaller.

5.2 INTENTIONALLY BLANK

6. ETCS OPERATIONAL RULES

6.1 PUTTING THE ETCS ON-BOARD INTO SERVICE

The driver switches the ETCS on-board on.

Levels 0, 1, ~~2, 3R~~, NTC

6.1.1 Entering data during start of mission

When requested by the ETCS on-board, the driver shall enter, re-enter or re-validate the driver identification, the train running number, the [ETCS](#) level, the radio network identification and the RBC identification / phone number.

In case the following text message is displayed:

“Radio network registration failed”

the driver shall enter the radio network identification.

6.1.2 Manual change of data

~~Under conditions defined by non-harmonised rules, if a change is required,~~ the driver shall enter/modify and validate:

- [the train running number.](#)
- [the driver identification while at standstill or, if allowed by national value, while running.](#)
- ~~the driver identification, the train running number,~~ the [ETCS](#) level, the radio network identification and the RBC identification / phone number [while at standstill.](#)

6.2 PREPARING A MOVEMENT

The ETCS on-board is in service.

Levels 0, 1, ~~2, 3R~~, NTC

In [ETCS](#) level ~~2 / 3R~~, in case the train is rejected the driver shall apply rule “[R](#)eacting to unexpected situations when preparing a train movement” (section 6.40.2).

6.2.1 The traction unit has to move as a train

The driver shall:

- apply rule “[E](#)ntering data” (section 6.4.1),
- select “Start”.

In case an acknowledgement for SR is requested, the driver shall apply [rule “The traction unit has to move as a train and an acknowledgement for SR is requested”](#) (section 6.2.4).

In case an acknowledgement for SH is requested in [ETCS level ~~2~~/~~3~~R](#), the driver shall apply rule “[R](#)eacting to unexpected situations when preparing a train movement” (section 6.40.1).

6.2.2 The traction unit has to move in SH

The driver shall prepare for shunting and apply rule “[P](#)erforming shunting movements in SH” ([section 6.3](#)).

6.2.3 The traction unit has to move in NL

The driver of the non leading [engine traction unit](#) shall prepare for tandem movement and apply rule “[P](#)erforming a tandem movement” ([section 6.32](#)).

6.2.4 The traction unit has to move as a train and an acknowledgement for SR is requested

Levels 1 without trackside signals, ~~2~~-[R](#) without trackside signals, ~~3~~

When the following symbol is displayed with a flashing frame:



The driver shall acknowledge, after having [informed the signaller and](#) received permission to start in SR ~~from the signaller~~ by means of European Instruction 7.

Before authorising a driver to start in SR, the signaller shall, according to non-harmonised rules:

- check if all the conditions for the route are met,
- check all restrictions and / or instructions that are necessary and include them in European Instruction 7,
- check for temporary speed restrictions to be included in European Instruction 7.

If the train is not located at an ETCS stop marker this authorisation is valid from the current location of the train to the ~~next~~-[first](#) ETCS stop marker [in the direction of travel](#). [If European](#)

Instruction 7 allows this ETCS stop marker to be passed, the driver is allowed to pass it using the override function and proceed up to the next ETCS stop marker.

If the train is located at an ETCS stop marker this authorisation is valid from this ETCS stop marker to the next one; the signaller shall authorise the driver to pass ~~the EOA~~ this ETCS stop marker by means of European Instruction 7.

The driver shall:

- receive European Instruction 7 from the signaller,
- check the applicable speed limit,
- use the override function if requested, and wait for the following symbol:



- start the train,
- not exceed the override EOA speed while this symbol is displayed.

~~If allowed by non-harmonised rules, the signaller can authorise the driver to pass several consecutive ETCS stop markers with only one written order.~~

It is possible to provide more than one European Instructions for an equal number of consecutive ETCS Stop Markers to be passed.

If the signaller can establish that the track up to the end of the authorisation to be issued is free then he ~~can~~ may exempt the driver from running on sight in SR ~~according to non-harmonised rules.~~

Levels 1 with trackside signals, ~~2-R~~ with trackside signals

When the following symbol is displayed with a flashing frame:



The driver shall apply rule 6.14 "Running in SR" (section 6.14).

6.2.5 The traction unit has to move in SL

The driver / train preparer shall make sure that all desks of any non-leading traction unit, which is electrically connected to and will be remotely controlled from the leading one, are closed and remain so as long as this traction unit is remotely controlled from the leading one.

6.3 PERFORMING SHUNTING MOVEMENTS IN SH

Rolling stock has to be moved in SH.

Levels 1, ~~2~~, 3R

6.3.1 Manual entry into SH

The driver shall select “Shunting” according to non-harmonised rules.

6.3.2 Automatic entry into SH

When the following symbol is displayed with a flashing frame:



the driver shall:

- first ensure he has the correct information concerning the movement he is to perform,
- then acknowledge.

6.3.3 Running in SH

When the following symbol is displayed:



the driver shall apply non-harmonised rules.

6.3.4 Maintain SH when changing the cab

When the shunting procedure requires the use of different cabs the driver is allowed to select “Maintain Shunting” before closing the driving desk.

6.3.5 Exit from SH

When all shunting movements to be performed in SH are finished the driver shall:

- select “Exit Shunting”,
- ensure that no traction unit remains in the “Maintain Shunting” status.

6.3.6 SH not granted

Levels ~~2,3~~R

When one of the following text messages is displayed:

“SH refused”

“SH request failed”

the driver shall inform the signaller about the situation.

Driver and signaller shall apply non-harmonised rules.

6.3.7 Passing a defined border of a shunting area

When a shunting movement needs to pass a defined border of a shunting area driver and signaller shall apply non-harmonised rules.

6.4 ENTERING TRAIN DATA

Train Data have to be entered or modified.

Levels 0, 1, ~~2, 3~~R, NTC

6.4.1 Entering train data during train preparation

The driver / train preparer shall enter / modify and validate all of the following train data:

- ETCS operational train category,
- train length,
- brake percentage,
- maximum train speed,
- axle load category,
- train fitted with airtight system,
- loading gauge,
- additional data for the available STMs,
- specific data for ATO, if requested.

if this data is not pre-configured on-board or received from ETCS external sources.

Before confirming train data that is pre-configured on-board or received from ETCS external sources and that are modifiable by the driver, the train preparer shall make sure the train data and the train ~~consist~~ composition match.

6.4.2 Manual change of train data

After each modification of the composition of the train and after a technical problem that leads to a modification of the train data, the train preparer / driver shall:

- determine the new train data,
- enter the new train data,
- validate the new train data.

6.4.3 Change of train data by ETCS external sources

When the following text message is displayed on the DMI:

“Train data changed”

a) if the change of train data leads to an application of the brake

When at a standstill, the driver shall:

- acknowledge the brake application,
- modify and/or validate the train data if requested by the on-board system,
- take into account the modified train data.

In [ETCS](#) level 1, and in [ETCS](#) level ~~2~~-R if no new MA is received, the signaller shall authorise the driver to pass the EOA (rule “~~A~~authorising the passing of an EOA”-[section 6.39](#)).

b) in all other cases

The driver shall take into account the modified train data.

6.5 INTENTIONALLY BLANK

6.6 INTENTIONALLY BLANK

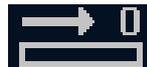
6.7 ENTERING AND OPERATING IN ETCS LEVEL 0

6.7.1 Announcement

The train is approaching an ETCS level 0 area.

Levels 1, ~~2, 3R~~, NTC

When a transition to ETCS level 0 is announced by displaying the following symbol:



the driver shall apply non-harmonised rules.

6.7.2 Acknowledgement

When the following symbol is displayed with a flashing frame:



the driver shall acknowledge.

6.7.3 Running

The train is running in an ETCS level 0 area.

When the following symbol is displayed:



the driver shall apply non-harmonised rules.

6.8 ENTERING AND OPERATING IN [ETCS](#) LEVEL 1

6.8.1 Announcement

The train is approaching an [ETCS](#) level 1 area.

Levels 0, ~~2, 3R~~, NTC

When a transition to [ETCS](#) level 1 is announced by displaying the following symbol:



the driver shall prepare to apply rules for [ETCS](#) level 1.

6.8.2 Acknowledgement

When the following symbol is displayed with a flashing frame:



the driver shall acknowledge.

6.8.3 Running

The train is running in an [ETCS](#) level 1 area.

When the following symbol is displayed:



the driver shall apply rules according to [ETCS](#) level 1.

6.9 ~~ENTERING AND OPERATING IN LEVEL 2~~ INTENTIONALLY BLANK

6.9.1 ~~Announcement~~

The train is approaching a level 2 area.

Levels 0, 1, 3, NTC

When a transition to level 2 is announced by displaying the following symbol:



the driver shall prepare to apply rules for level 2.

6.9.2 ~~Acknowledgement~~

When the following symbol is displayed with a flashing frame:

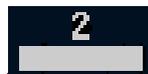


the driver shall acknowledge.

6.9.3 ~~Running~~

The train is running in a level 2 area.

When the following symbol is displayed:



the driver shall apply rules according to level 2.

6.10 ENTERING AND OPERATING IN ETCS LEVEL 3R

6.10.1 Announcement

The train is approaching an ETCS level 3R area.

Levels 0, 1, ~~2~~-NTC

When a transition to ETCS level 3R is announced by displaying the following symbol:



the driver shall prepare to apply rules for ETCS level 3R.

6.10.2 Acknowledgement

When the following symbol is displayed with a flashing frame:



the driver shall acknowledge.

6.10.3 Running

The train is running in an ETCS level 3R area.

When the following symbol is displayed:



the driver shall apply rules according to ETCS level 3R.

When required to manually confirm train integrity on the DMI, the driver shall do so only at standstill and according to RU rules.

6.11 ENTERING AND OPERATING IN ETCS LEVEL NTC

6.11.1 Announcement

The train is approaching an ETCS level NTC area.

Levels 0, 1, ~~2~~3R

When a transition to ETCS level NTC is announced by displaying the following symbol:



the driver shall apply non-harmonised rules.

6.11.2 Acknowledgement

When the following symbol is displayed with a flashing frame:



the driver shall acknowledge.

6.11.3 Running

The train is running in an ETCS level NTC area.

When the following symbol is displayed:



the driver shall apply non-harmonised rules.

Note: the symbols which are displayed on the DMI are given as examples; it is in reality a specific symbol for each NTC.

6.12 RUNNING IN FS

Levels 1, ~~2~~, ~~3R~~

When the following symbol is displayed:



the driver

- shall not exceed the permitted speed
- If DAS information is available on-board:
- may follow the target advice speed when displayed on the DMI
- may coast when  is displayed
- may respect the stopping points if indicated
- may request a stopping point to be skipped if instructed and this option is available on the DMI
- may operate the doors when invited to do so by relevant DMI indications

In ETCS level 1 with trackside signals the driver is authorised to proceed without a new MA when the trackside signal shows a proceed aspect.

If in addition the following text message is displayed:

“Entering FS”

the driver shall not exceed speed restrictions that apply for the part of the train that is not covered by the FS MA.

6.13 RUNNING IN OS

Levels 1, ~~2, 3~~R

When the following symbol is displayed with a flashing frame:



the driver shall:

- acknowledge,
- start or continue ~~running-on-sight~~[applying Appendix B2 rule 9](#).

When the following symbol is displayed:



the driver shall:

- ~~run-on-sight~~[apply Appendix B2 rule 9](#) as long as this symbol is displayed,
- not exceed the permitted speed.

If in addition the following text message is displayed:

“Entering OS”

the driver shall not exceed speed restrictions that apply for the part of the train that is not covered by the OS MA.

6.14 RUNNING IN SR

Levels 1, ~~2~~, ~~3~~R

When the following symbol is displayed with a flashing frame:



the driver shall:

- first receive an authorisation for ERTMS train movement,
- check the applicable speed limit,
- then acknowledge.

When the following symbol is displayed:



the driver shall:

- run on sight, unless an operational instruction exempts him from running on sight in SR,
- not exceed the applicable speed limit,
- in ETCS level 1 without trackside signals, and in ETCS level ~~2~~-R without trackside signals, ~~and in level 3, stop at~~when approaching the next ETCS stop marker, inform the signaller and apply rule “Authorizing the passing of an EoA” (section 6.39) unless already authorized to pass this ETCS stop marker by means of a European Instruction.
- ~~inform the signaller about the situation and follow any instructions given.~~

~~If allowed by non-harmonised rules, the driver can be authorised by the signaller to pass several consecutive ETCS stop markers with only one operational instruction.~~

It is possible to provide more than one European Instructions for an equal number of consecutive ETCS Stop Markers to be passed.

6.15 RUNNING IN LS

Levels 1, ~~2~~R

When the following symbol is displayed with a flashing frame:



the driver shall acknowledge according to non-harmonised rules.

When the following symbol is displayed:



the driver shall apply non-harmonised rules.

6.16 RUNNING IN UN

Level 0

When the following symbol is displayed with a flashing frame:



the driver shall acknowledge according to non-harmonised rules.

When the following symbol is displayed:



the driver shall apply non-harmonised rules.

6.17 RUNNING IN SN

Level NTC

When the following symbol is displayed with a flashing frame:



the driver shall acknowledge according to non-harmonised rules.

When the following symbol is displayed:



the driver shall apply non-harmonised rules.

6.18 APPROACHING AN EOA WITH A RELEASE SPEED INDICATION

Levels 1, ~~2~~, ~~3R~~

When the train is approaching an EOA and a release speed is displayed on the DMI, the driver is authorised:

- to approach a signal, an ETCS stop marker ~~+~~an ETCS location marker or a buffer stop which is a short distance behind the EOA indicated on the DMI without exceeding the release speed,
- in [ETCS](#) level 1 with trackside signals to proceed without exceeding the release speed when the trackside signal shows a proceed aspect.

6.19 MANAGING A TRACK AHEAD FREE REQUEST

The train is at a standstill or approaching a trackside signal, or an ETCS stop marker / ETCS location marker.

Levels ~~2,3~~ R

When the following symbol is displayed:



the driver is allowed to confirm that the track ahead is free if he can ascertain that the track section between the head of the train and the next trackside signal, ~~or~~ ETCS stop marker /or ETCS location marker is free.

6.20 PASSING A SECTION WITH LOWERED PANTOGRAPH(S)

The train is approaching a section of the line to be passed with lowered pantograph(s).
 Levels 1, ~~2,3~~R

When the following symbol is displayed:



or, when ~~running without an MA~~, the following marker board is encountered



the driver shall lower the pantograph(s), taking into account their position.

When the following symbol is displayed:



or, when ~~running without an MA~~, the following marker board is encountered



the driver shall keep the pantograph(s) lowered.

When the following symbol is displayed:



or, when ~~running without an MA~~, the following marker board is encountered



the driver is authorised to raise the pantograph(s), taking into account their positions.

** For the exact dimensions and layout of the icons, EN 16494 [2] needs to be used*

6.21 CHANGING THE ELECTRIC POWER SUPPLY

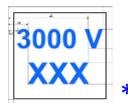
The train is approaching a section of the line where the electric power supply must be changed.

Levels 1, ~~2~~, ~~3~~R

When one of the following symbols is displayed:



or when one of the following marker boards is encountered:



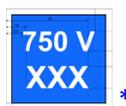
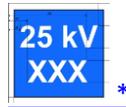
the driver shall change the electric power supply accordingly.

When one of the following symbols is displayed:





or when one of the following marker boards is encountered:

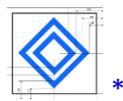


the driver shall ensure that the power supply has changed accordingly.

When the following symbol is displayed:



or when the following marker board is encountered:



the driver is informed about approaching a line without any traction system.

When the following symbol is displayed:



or when the following marker board is encountered:



the driver is informed about reaching a line without any traction system.

** For the exact dimensions and layout of the icons, EN 16494 [2] needs to be used*

6.22 PASSING A SECTION WITH MAIN POWER SWITCH SWITCHED OFF

The train is approaching a section of the line where the main power switch must be switched off.
 Levels 1, ~~2~~, 3R

When the following symbol is displayed:



or, when ~~running without an MA~~, the following marker board is encountered



the driver shall switch off the main power switch, taking into account the position of the pantographs.

When the following symbol is displayed:



or, when ~~running without an MA~~, the following marker board is encountered



the driver shall keep the main power switch switched off.

When the following symbol is displayed:



or, when ~~running without an MA~~, the following marker board is encountered



the driver is authorised to switch on the main power switch, taking into account the position of the pantographs.

* For the exact dimensions and layout of the icons, EN 16494 [2] needs to be used

6.23 PASSING A NON STOPPING AREA

The train is approaching a non stopping area.

Levels 1, ~~2~~, 3R

When the following symbol is displayed:



or when the following marker board is encountered:

XX

the driver is notified of an upcoming area in which he shall avoid stopping.

When the following symbol is displayed:



or when the following marker board is encountered:

XX

the driver shall avoid stopping.

When the following marker board is encountered:

XX

the driver shall no longer be prevented from stopping.

6.24 PASSING A SECTION WITH INHIBITION OF MAGNETIC SHOE BRAKE

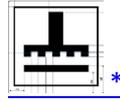
The train is approaching a section of the line where the magnetic shoe brake shall not be used.

Levels 1, ~~2~~, 3R

When the following symbol is displayed:



or when the following marker board is encountered and the inhibition is known to concern the magnetic shoe brake:



the driver shall release the magnetic shoe brake, if applied, except in case of an emergency situation.

When the following symbol is displayed:

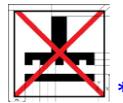


or when the following marker board is encountered and the inhibition is known to concern the magnetic shoe brake:



the driver shall not use the magnetic shoe brake except in case of an emergency situation.

When the following marker board is encountered:



the driver is allowed to use the magnetic shoe brake if the inhibition is known to concern the magnetic shoe brake.

* For the exact dimensions and layout of the icons, EN 16494 [2] needs to be used

6.25 PASSING A SECTION WITH INHIBITION OF EDDY CURRENT BRAKE

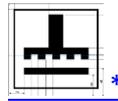
The train is approaching a section of the line where the eddy current brake shall not be used.

Levels 1, ~~2~~, ~~3~~R

When the following symbol is displayed:



or when the following marker board is encountered and the inhibition is known to concern the eddy current brake:



the driver shall release the eddy current brake, if applied, except in case of an emergency situation.

When the following symbol is displayed:

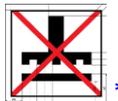


or when the following marker board is encountered and the inhibition is known to concern the eddy current brake:



the driver shall not use the eddy current brake except in case of an emergency situation.

When the following marker board is encountered:



the driver is allowed to use the eddy current brake if the inhibition is known to concern the eddy current brake.

* For the exact dimensions and layout of the icons, EN 16494 [2] needs to be used

6.26 PASSING A SECTION WITH INHIBITION OF REGENERATIVE BRAKE

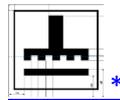
The train is approaching a section of the line where the regenerative brake shall not be used.

Levels 1, ~~2~~, ~~3~~R

When the following symbol is displayed:



or when the following marker board is encountered and the inhibition is known to concern the regenerative brake:



the driver shall release the regenerative brake, if applied, except in case of an emergency situation.

When the following symbol is displayed:



or when the following marker board is encountered and the inhibition is known to concern the regenerative brake:



the driver shall not use the regenerative brake except in case of an emergency situation.

When the following marker board is encountered:



the driver is allowed to use the regenerative brake if the inhibition is known to concern the regenerative brake.

* For the exact dimensions and layout of the icons, EN 16494 [2] needs to be used

6.27 PASSING A PRESSURE SEAL SECTION

The train is approaching a section of the line where the air condition intakes shall be closed.

Levels 1, ~~2~~, ~~3~~R

When the following symbol is displayed:



or when the following marker board is encountered:

XX

the driver shall close the air conditioning intakes.

When the following symbol is displayed:



or when the following marker board is encountered:

XX

the driver shall keep the air conditioning intakes closed.

When the following symbol is displayed:



or when the following marker board is encountered:

XX

the driver is authorised to open the air conditioning intakes.

6.28 SOUNDING THE AUDIBLE WARNING DEVICE

Levels 1, ~~2~~, ~~3~~R

When the following symbol is displayed:



or when the following marker board is encountered:



the driver shall apply the audible warning device unless prevented by non-harmonised rules.

** For the exact dimensions and layout of the icon, EN 16494 [2] needs to be used*

6.29 CHANGING OF ADHESION FACTOR

The train is in a section of line where the adhesion factor could be changed.

Levels 1, ~~2, 3~~R

If the national value allows the driver to select “Slippery rail”, he may do so when the adhesion conditions are poor or when informed by the signaller. If the driver is not informed by the signaller before selecting “Slippery rail”, he shall inform the signaller.

When a signaller is informed about poor adhesion conditions, he shall activate the ETCS reduced adhesion function, where possible, and if this is not possible he shall take measures as prescribed by the IM, until normal operation is restored.

When the following symbol is displayed:



the driver shall apply internal RU rules. ~~apply non-harmonised rules.~~

6.30 PASSING A RADIO HOLE

The train is in a section of line without radio coverage.

Levels ~~2, 3~~ R

When the following symbol is displayed:



the driver may continue on any valid movement authority.

If the driver reaches the end of authority and the symbol is still displayed, the driver shall inform the signaller. Signaller and driver shall apply ~~the rule for~~ “A” authorising the passing of an EOA” [\(section 6.39\)](#).

6.31 ~~ENTERING AN OCCUPIED TRACK SECTION WITHIN A~~ STATION INTENTIONALLY BLANK

~~It is necessary to enter a track section that is occupied in a station.~~

~~Levels 1, 2, 3~~

~~When a train has to enter an occupied track, the signaller shall:~~

~~obtain confirmation that the occupying train is at a standstill and will remain at a standstill,~~

~~set the route for the train that has to enter the occupied track~~

~~if required by non-harmonised rules, authorise the train to enter the occupied track.~~

~~In case of an unplanned movement and if required by non-harmonised rules, the signaller shall inform the drivers of both trains of the circumstances before setting the route. The driver of the train that has to enter the occupied track shall follow the instructions received from the signaller.~~

6.32 PERFORMING A TANDEM MOVEMENT

A non leading [engine traction unit](#) is coupled to the master [engine traction unit](#) (or to a train including the master [engine traction unit](#)).

Levels 0, 1, ~~2, 3R~~, NTC

6.32.1 Entry into NL

The driver of the non leading [engine traction unit](#) shall select “Non-Leading”.

When the following symbol is displayed on the DMI:



the driver of the non leading [engine traction unit](#) shall confirm to the driver of the leading [engine traction unit](#) that the non leading traction unit is in NL.

6.32.2 Performing the tandem movement

~~The tandem movement shall be performed according to~~ [Both drivers shall apply non-harmonised internal RU](#) rules.

6.32.3 Exit from NL

When the train is at a standstill the driver of the non leading [engine traction unit](#) shall:

- apply the brakes,
- confirm to the driver of the leading [engine traction unit](#) that the non leading traction unit is not any more in NL.

6.33 REVOKING AN AUTHORISATION FOR ERTMS TRAIN MOVEMENT

The signaller decides to change existing traffic arrangements.

Levels 1, ~~2, 3~~R

6.33.1 **A**

If possible in [ETCS](#) level ~~2-R~~ and in level 3 the signaller shall revoke an MA by the use of the co-operative shortening of MA.

6.33.1 **B**

In all other cases, the signaller shall apply non-harmonised rules [to stop the train if it is not already at standstill](#).

~~When non-harmonised rules stipulate that a train has to be~~ [Once the train is](#) at a standstill [and before making traffic arrangements, the signaller shall order the driver to remain at a standstill by means of European Instruction 3 or other available means and to delete any MA remaining on-board if required by means of European Instruction 3.](#)

6.33.2

To restart the trains the signaller shall:

- issue an authorisation for ERTMS train movement,
- ~~issue European Instruction 04 in order to~~ revoke European Instruction 3 [if one has been issued](#).

6.34 TAKING MEASURES IN THE EVENT OF AN EMERGENCY

An emergency situation occurs.

Levels 1, ~~2, 3~~R

6.34.1 To protect the trains

~~When a performer discovers an emergency situation he shall perform all actions necessary to avoid or reduce the effect of the situation and inform the signaller as soon as possible according to non-harmonised rules.~~

~~When a signaller is informed of an emergency situation he shall immediately protect endangered trains.~~

When a member of staff discovers an emergency situation, he shall apply Appendix B2 rule 14.

To stop trains in ETCS level ~~2~~ and in level ~~3~~R, the signaller may use the emergency stop order; the emergency stop order shall not be revoked before it is safe for these trains to restart.

~~The signaller shall stop all other trains approaching the danger area according to non-harmonised rules.~~

~~The signaller shall inform all drivers as appropriate.~~

The signaller may use European Instruction 3 to keep the stopped trains at standstill if required.

When the following text message is displayed:

“Emergency stop”

and the train is tripped, the driver shall apply rule “Rresponding to a trip” (section 6.41).

6.34.2 To restart the trains

~~According to non-harmonised rules, t~~he signaller shall:

- decide if it is possible to authorise train movement,
- decide if instructions and / or restrictions for train movement are necessary,
- revoke the emergency stop order if one has been issued,
- revoke European Instruction 3 if one has been issued
- give authorisation to the drivers to restart.

To restart trains that have not been tripped and if instructions and / or restrictions are necessary the signaller shall issue an European Instruction(s). In ETCS level 1 with trackside signals the driver shall run on sight up to the next trackside signal.

To restart trains that have been tripped, signaller and driver shall ~~take measures in response to a trip (apply rule “R~~esponding to a trip - to restart” (section 6.41.2). ~~The signaller shall include necessary instructions and / or restrictions for train movement according to non-harmonised rules in European Instruction 2.~~

6.34.3 To protect and restart shunting movements

The signaller and the driver shall apply non-harmonised rules.

6.35 STOPPING IN A SAFE AREA

The driver needs to stop the train in a safe area.

Levels 1, ~~2, 3~~R

The driver shall toggle on the display of the indication of the safe areas where the train can stop.

When the following symbol is displayed:



or when the following marker board is encountered:



and the driver decides to stop at the indicated safe area he shall take into account the remaining distance displayed on the DMI or the distance up to the marker board marking the start of the safe area.

When the following symbol is displayed:



or when the following marker board is encountered:



and the driver decides to stop at the indicated safe area, he shall stop the train taking into account its length.

When the following marker board is encountered:



the driver is informed that he has reached the end of the safe area.

* For the exact dimensions and layout of the icon, EN 16494 [2] needs to be used

6.36 PROPELLING IN RV

A train has to be moved in the reverse direction inside an emergency propelling area.

Levels 1, ~~2~~, ~~3~~R

6.36.1 Preparing the movement to be performed in RV

When the train is at a standstill and the following symbol is displayed:



the driver shall trigger the transition to RV while informing the signaller if possible and taking into account any further instructions.

6.36.2 Running in RV

When the following symbol is displayed with a flashing frame:



the driver shall:

- acknowledge,
- propel the train ~~according to non-harmonised rules~~ following any instructions given by the signaller as soon as the following symbol is displayed:



- not exceed the maximum speed for RV,
- not exceed the permitted distance to run.

6.36.3 Exceeding the permitted distance in RV

When the following text message is displayed with a flashing frame:

“RV distance exceeded”,

the driver shall:

- report to the signaller,
- acknowledge at a standstill if the permitted distance in RV has not been extended,
- release the brake.

6.36.4 Exit from RV

After the train has completed its propelling and as soon as it is at a standstill the driver shall report to the signaller. If no additional movement in RV is required the driver shall close the driving desk to exit RV.

6.37 REACTING TO UNINTENTIONAL MOVEMENTS

After being at a standstill the train / shunting movement has moved unintentionally and the ETCS on-board has triggered the brake.

Levels 1, ~~2~~, 3R

When the following text message is displayed:

“Runaway movement”,

the driver shall secure the train / shunting movement ~~according to non harmonised rules~~ according to internal RU rules and acknowledge the brake application.

6.38 MANAGING ROUTE UNSUITABILITY DETECTED BY THE ON-BOARD SYSTEM

Levels 1, ~~2~~, 3R

When any of the following messages is displayed:

“Route unsuitable - loading gauge”

“Route unsuitable - traction system”

“Route unsuitable – axle load category”

a route unsuitability is detected.

Driver shall stop the train using service brake.

Driver ~~and signaller shall apply non harmonised rules~~ shall inform the signaller and follow any instructions given.

6.39 AUTHORISING THE PASSING OF AN EOA

It is necessary to authorise a driver to pass an EOA.

Levels 1, ~~2, 3~~R

Before authorising a driver to pass an EOA by means of European Instruction 1 the signaller shall, according to non-harmonised rules:

- check if all the conditions for the route are met,
- check all restrictions and / or instructions that are necessary and include them in European Instruction 1,
- check for temporary speed restrictions to be included in European Instruction 1.

If the signaller can establish that the track up to the end of the authorisation to be issued is free then he ~~can~~ may exempt the driver from running on sight in SR ~~according to non-harmonised rules~~.

~~In level 1 without trackside signals, in level 2 without trackside signals and in level 3, if allowed by non-harmonised rules, the signaller can authorise the driver to pass several consecutive ETCS stop markers with only one operational instruction.~~

It is possible to provide more than one European Instructions for an equal number of consecutive ETCS Stop Markers to be passed.

To pass the EOA, the driver shall:

- receive European Instruction 1 from the signaller for this EoA,
- check the applicable speed limit,
- use the override function,
- and when the following symbol is displayed:



- start the train or continue moving,
- not exceed the override EOA speed while this symbol is displayed.

6.40 REACTING TO UNEXPECTED SITUATIONS WHEN PREPARING A TRAIN MOVEMENT

Levels ~~2,3~~ R

6.40.1 The traction unit has to move as a train but an acknowledgement for SH is requested

When the following symbol is displayed with a flashing frame:



before acknowledging the driver shall inform the signaller about the situation-

~~Driver and signaller shall apply non-harmonised rules.~~ [and proceed according to the instructions received by the signaller.](#)

6.40.2 The train is rejected

When the following text message is displayed on the DMI:

“Train is rejected”

the driver shall inform the signaller about the situation. Driver and signaller shall apply non-harmonised rules.

6.41 RESPONDING TO A TRIP

A train or a shunting movement is tripped.

Levels 1, ~~2~~, ~~3~~R

6.41.1 Immediate measures

When the following symbol is displayed:



the driver shall assume that there is a potentially dangerous situation and he shall perform all actions necessary to avoid or reduce the effect of this situation. This may include moving the train / shunting movement backwards ~~according to non-harmonised rules~~.

When the following symbol is displayed with a flashing frame:



the driver shall acknowledge and apply the brakes.

a) In case an immediate backward movement is necessary due to an emergency

When, ~~in accordance with non-harmonised rules~~, the driver decides or is instructed by the signaller to move the train / shunting movement backwards due to an emergency

and ~~when the following symbol is displayed with a flashing frame:~~



~~the driver shall acknowledge.~~

When the following symbol is displayed:



the driver shall:

~~release the emergency brake and,~~

move the train / shunting movement backwards [following any instructions given by the signaller](#).

After moving backwards as soon as the train / shunting movement is at a standstill, the driver shall inform the signaller about the situation.

b) In all other cases

~~When the following symbol is displayed with a flashing frame:~~



~~the driver shall acknowledge.~~

When the following symbol is displayed:



the driver shall inform the signaller about the situation [and follow any instructions given](#).

6.41.2 To ~~continue running~~ restart

a) In the initial direction

Before giving permission to the driver to proceed after a trip by means of European Instruction 2 the signaller shall, according to non-harmonised rules:

- check if all the conditions for the route are met,
- check all restrictions and / or instructions that are necessary and include them in European Instruction 2,
- check for temporary speed restrictions to be included in European Instruction 2.

If the signaller can establish that the track [up to the end of the authorised movement](#) is free then he ~~can~~ [may](#) exempt the driver ~~of a train~~ from running on sight in SR ~~if allowed by non-harmonised rules~~.

To proceed the driver shall:

- receive European Instruction 2 with all additional instructions given by the signaller,
- according to the task to be performed select “Start” or “SH” and follow the instructions given in European Instruction 2,
- restart the train / shunting movement.

If in ETCS level ~~2 and in level 3R~~, at any step of the procedure, the following text message is displayed:

“Communication error”,

the driver shall inform the signaller about the situation. Signaller and driver shall ~~take measures to pass an EOA~~ apply (rule “~~A~~authorising the passing of an EOA” (section 6.39)). In this case, European Instruction 1 shall be issued by the signaller ~~in place~~ instead of European Instruction 2.

b) In the opposite direction

The signaller shall order the driver to remain at standstill and to perform End of Mission by means of European Instruction 3, and then to restart in the opposite direction by means of European Instruction 7.

The driver shall carry out the End of Mission and then apply rule ~~6.1~~ “Putting the on-board into service” (section 6.1) and rule “Preparing a movement” (section 6.2). If the driver is not operating from the leading cab, he shall apply internal RU rules to ensure safe running.

6.41.3 No movement required after a trip

In the case of a train / shunting movement not required to be moved after a trip, ~~driver and signaller shall apply non-harmonised rules.~~ the signaller shall order the driver to remain at standstill and to perform End of Mission by means of European Instruction 3.

6.41.4 Trip in SH when passing a defined border of a shunting area

Levels 1, ~~2, 3R~~

When a shunting movement is tripped when passing a defined border of a shunting area driver and signaller shall apply non-harmonised rules.

6.42 MANAGING AN ETCS TRACKSIDE MALFUNCTION

The on-board receives the information of an ETCS trackside equipment malfunction.

Levels 1, ~~2, 3R~~

When the following text message is displayed:

“Trackside malfunction”,

the driver shall inform the signaller about the situation.

6.43 MANAGING INCOMPATIBILITY BETWEEN ETCS TRACKSIDE AND ETCS ON-BOARD

An incompatibility between ETCS trackside and ETCS on-board ~~occurs~~ is detected by the system and the train is tripped.

Levels 1, ~~2, 3~~ R

When the following text message is displayed:

“Trackside not compatible”,

the train cannot continue in ETCS.

The driver ~~shall inform the signaller about the situation~~ shall apply rule “Responding to a trip” (section 6.41).

~~Driver and signaller shall apply non-harmonised rules.~~

6.44 MANAGING A LEVEL CROSSING NOT PROTECTED

The train is approaching a level crossing which is not protected.

Levels 1, ~~2, 3~~ R

6.44.1 If in FS, OS or LS

When the following symbol is displayed:



the driver shall apply Appendix B2 rule 7 ~~of Appendix B.~~

6.44.2 If in SR

When the following text message is displayed:

“Level crossing not protected”,

the driver shall apply Appendix B2 rule 7 ~~of Appendix B.~~

6.45 MANAGING A BALISE READ ERROR

A balise read error occurs and the brakes are triggered by the ETCS on-board (the train is not tripped).

Levels 1, ~~2~~, ~~3~~R

When the following text message is displayed:

”Balise read error”,

and the train is not tripped, the driver shall inform the signaller about the situation.

If no new MA is received, when the train has come to a standstill, the signaller shall authorise the driver to pass the EOA by applying rule “~~A~~authorising the passing of an EOA” ([section 6.39](#)).

If the situation is repeated, driver and signaller shall apply non-harmonised rules.

6.46 MANAGING A FAILED LEVEL TRANSITION

The transition takes place but no MA valid beyond the transition point is received on-board or the transition does not take place when passing the transition point.

Levels 1, ~~2~~, ~~3~~R

The [ETCS](#) level transition point may be marked through the following trackside marker board:



* For the exact dimensions and layout of the icon, EN 16494 [2] needs to be used

6.46.1 If the train has been tripped

~~The d~~Driver and ~~the~~ signaller shall ~~take measures in response of a trip~~ ([apply](#) rule “~~R~~responding to a trip” ([section 6.41](#))).

After selecting “Start” the driver shall:

- check the correct ETCS level to be selected,
- change the ETCS level (rule “~~M~~anual change of data” (section 6.1.2)),

and then restart the train.

In case the ETCS level to be selected is not available on-board, driver and signaller shall apply [Appendix B2 rule 15](#) ~~non-harmonised rules~~.

6.46.2 If in SR

The driver shall:

- stop the train,
- apply the following [rule “In all other cases”](#) (section 6.46.3).

6.46.3 In all other cases

The driver shall:

- inform the signaller about the situation,
- when at a standstill, check the correct ETCS level to be selected,

- change the ETCS level (rule “~~M~~manual change of data” (section 6.1.2)),

and then restart the train.

In case the ETCS level to be selected is not available on-board, driver and signaller shall apply ~~non-~~
~~harmonised rules~~ [Appendix B2 rule 15](#).

6.47 MANAGING ABSENCE OF RBC INFORMATION

There is no RBC information received in an area not identified as a radio hole and the brakes are triggered by the ETCS on-board (the train is not tripped).

Levels ~~2, 3R~~

When the following text message is displayed:

”Communication error”,

the driver shall inform the signaller about the situation when at a standstill.

If no new MA is received when the train has come to a standstill, the signaller shall authorise the driver to pass the EOA by applying rule “~~A~~authorising the passing of an EOA” ([section 6.39](#)).

6.48 MANAGING A RADIO COMMUNICATION FAILURE

An ETCS radio communication failure occurs.

Levels 0, 1, ~~2, 3R~~, NTC

When the following symbol is displayed:



the driver shall check the ETCS level, the radio network identification, the RBC identification / phone number, and correct them if necessary (rule “Manual change of data” (section 6.1.2)).

If the radio communication with the RBC still cannot be established, the driver shall inform the signaller about the situation.

a) when in ETCS level 2-R preparing a movement and the traction unit has to move in SH

The driver and the signaller shall apply non-harmonised rules.

b) when in ETCS level 2-R preparing a tandem movement

The driver of the non leading ~~engine~~traction unit shall inform the driver of the leading ~~engine~~traction unit about the radio communication failure. Both drivers shall apply ~~non-~~harmonised internal RU rules.

c) in all other cases

The signaller shall authorise the driver to pass the EOA by applying rule “~~A~~authorising the passing of an EOA” ([section 6.39](#)).

6.49 MANAGING A FAILURE OF SELF TEST

Levels 0, 1, ~~2,3~~R, NTC

When the information about the failure of an ETCS device is shown to the driver, he shall switch off the ETCS on-board and then switch it on again to trigger a new self test. If the same information is shown again, the driver [shall attempt to troubleshoot the problem using the applicable technical information. If this attempt fails or is not possible, the driver](#) shall inform the signaller about the situation.

The driver shall request a change of traction unit.

If the traction unit must be moved driver and signaller shall apply ~~non-harmonised rules~~[Appendix B2 rule 15](#).

6.50 MANAGING A FAILURE AFFECTING THE ON-BOARD RADIO EQUIPMENT

Levels 0, 1, ~~2,3~~R, NTC

When a failure of the on-board radio equipment is detected the driver shall inform the signaller about the situation.

6.50.1 During the preparation of the traction unit

Levels ~~2,3~~R

The driver shall request a change of traction unit.

If the traction unit must be moved, ~~driver and signaller shall apply non-harmonised rules.~~[the driver shall inform the signaller, apply RU rules and any instructions given by the signaller.](#)

If the traction unit need not be moved, the driver shall switch off the ETCS on-board.

6.50.2 While running

Levels 1 with infill function by radio, ~~2,3~~R

Driver and signaller shall apply ~~non-harmonised rules.~~[Appendix B2 rule 15](#).

6.51 MANAGING A FAILED DMI **WITH BLANK SCREEN**

The DMI fails ~~and shows a blank screen.~~

Levels 0, 1, ~~2, 3R~~, NTC

When the DMI fails ~~and shows a blank screen the driver shall inform the signaller about the situation~~ driver and signaller shall apply Appendix B2 rule 15, unless another DMI is available on the desk.

~~Driver and signaller shall apply non-harmonised rules.]~~

6.52 MANAGING A SYSTEM FAILURE

Levels 0, 1, ~~2, 3R~~, NTC

When the following symbol is displayed:



the driver ~~shall inform the signaller about the situation~~ shall attempt to troubleshoot the problem using the applicable technical information.

If this attempt fails or is not possible, driver and signaller shall apply Appendix B2 rule 15.

~~Driver and signaller shall apply non-harmonised rules.]~~

6.53 MANAGING A NTC FAILURE

Levels 0, 1, ~~2, 3R~~, NTC

When the following text message is displayed:

“[name of NTC] failed”

the driver shall acknowledge and apply non-harmonised rules.

6.54 MANAGING A VBC

Levels 0, 1, ~~2, 3R~~, NTC

Driver and signaller shall apply non-harmonised rules.

6.55 RUNNING IN AD

The driver switches the ATO on-board on.

Levels 1, 2, 3R

6.55.1 Engaging ATO

When the following symbol is displayed, the driver may engage automated train operation by selecting it:



When ATO is engaged the following symbol is displayed:



6.55.2 Running in ATO

When the following symbol is displayed:



the driver:

- shall activate “skip stopping point” when required by the timetable or if instructed to do so
- after coming to a standstill at an operational stopping point, may manually move the train to correct its position, in the forward direction (when  is displayed) after notifying any passengers or in the reverse direction (when  is displayed, if authorised by the signaller and after notifying any passengers accordingly, until  is displayed.
- shall operate door opening/closing if invited to do so by the respective DMI indications

6.55.3 Disengaging ATO

The following driver actions will cause ATO to disengage:

- selecting the button associated with this icon
- applying the brake
- switching off the ATO
- selecting Override

Once the ATO disengages, the driver shall observe the icon displaying the current ETCS mode and shall follow the rule applicable for the mode entered.

6.56 MANAGING A TIMS FAILURE

Level R when train integrity has to be confirmed

When the train preparer / driver of a train scheduled to run or running in an ETCS level R area where train integrity has to be confirmed becomes aware that the TIMS has failed, he shall apply Appendix B2 rule 15.

6.57 MANAGING AN IMPAIRED ODOMETER FAILURE

Levels 1, R

When the following text message is displayed:

“odometer impaired”

the driver shall apply Appendix B2 rule 15.

7. GSM/R VOICE RADIO OPERATIONAL RULES

7.1 SELECTING THE GSM-R MODE

The driver needs to change the GSM-R mode.

When the displayed GSM-R mode does not correspond with the task to be performed (train or shunting movement), the driver shall select the correct mode.

7.2 ENTERING THE FUNCTIONAL NUMBER

The train preparer / driver is performing the registration.

The train preparer / driver shall enter the functional number:

- as early as possible before the initial departure,
- every time the functional number changes.

7.3 SELECTING THE GSM-R NETWORK AT A BORDER CROSSING

The train is approaching a border crossing.

7.3.1 Inhibition of automatic network selection

When approaching a section in the vicinity of network borders, the driver shall inhibit the (~~on-board~~on-board) automatic network selection function in the cab radio, if activated, when instructed to do so by the Route Book.

7.3.2 Selection of another GSM-R network

When according to the Route Book or a GSM-R network marker



** For the exact dimensions and layout of the icon, EN 16494 [2] needs to be used*

the driver is instructed to select another GSM-R network, he shall select the indicated GSM-R network on the cab radio unless the network is selected following an ETCS trackside command. If

the driver is engaged in an emergency call, he shall not proceed with the manual selection as long as the call is active.

7.4 PERFORMING A DE-REGISTRATION

The train has to be manually de-registered.

At the end of the train run or when requested by the signaller, ~~the~~ driver shall carry out the de-registration ~~according to non-harmonised rules.~~

7.5 INTENTIONALLY BLANK

7.6 MANAGING A FAILURE OF SELF TEST

When the following text message is displayed:

“Self test failed”,

the driver shall inform the signaller about the situation.

Driver and signaller shall apply [Appendix B2](#) rule 8 ~~of Appendix B.~~

7.7 MANAGING A LACK OF GSM-R NETWORK AFTER THE TRAIN HAS ENTERED SERVICE

When the following text message is displayed:

“No network”,

Driver and signaller shall apply [Appendix B2](#) rule 8.2 ~~of Appendix B.~~

7.8 INTENTIONALLY BLANK

7.9 MANAGING A FAILURE OF DE-REGISTRATION

If the de-registration is not possible the driver shall inform the signaller about the situation, [apply RU rules and follow any instructions given.](#)

~~Driver and signaller shall apply non-harmonised rules.~~

7.10 TAKING MEASURES IN CASE THE FUNCTIONAL NUMBER IS NOT AVAILABLE

When the following text message is displayed:

“Number not available”,

the train preparer / driver shall check the ~~correct~~-number and try again to register [using the correct number](#).

If the registration fails again, he shall inform the signaller about the situation, [apply RU rules and follow any instructions given](#).

~~Train preparer / driver and signaller shall apply non-harmonised rules.~~

7.11 TAKING MEASURES IN CASE THE FUNCTIONAL NUMBER IS ALREADY USED

When the following text message is displayed:

“Number already used”,

the train preparer / driver shall check the number and try again to register using the correct number.

If the functional number used was correct, the train preparer / driver shall call that functional number and ask the other party to deregister the current number unless prevented from doing so by non harmonised rules.

- If the call is successful and the other party deregisters the number in question, the train preparer / driver shall re-start the functional number registration procedure.
- If there is no response to the call, the train preparer / driver shall initiate forced deregistration of the specific functional number.

In all other cases, train preparer / driver shall inform the signaller on the issue [and follow any instructions given](#). ~~Train preparer / driver and signaller shall apply non-harmonised rules.~~

7.12 MANAGING A FAILURE WHEN REGISTERING THE FUNCTIONAL NUMBER

When it is not possible to register the functional number, the train preparer / driver shall inform the signaller about the situation, [apply RU rules and follow any instructions given](#).

~~Train preparer / driver and signaller shall apply non-harmonised rules.~~

7.13 GSM-Public as primary communication (if this option is available ~~enboard~~on-board)

7.13.1 Changing-over from GSM-R to GSM-Public

When instructed through a marker board indicating entry in a GSM network or through instructions on the route book, the driver shall select the indicated public GSM network, unless the network is automatically selected.

Driver and signaller shall apply non-harmonised rules.

7.13.2 Changing-over from GSM-Public to GSM-R

When instructed through a marker board indicating (re-)entry into a GSM-R network or through instructions on the route book, the driver shall select the indicated GSM-R network, unless the GSM-R network is automatically selected.

If the GSM-R network is not available, the driver shall apply [Appendix B2](#) rule 8.2-~~of Appendix B~~.

7.14 GSM-Public as fall-back communication (if this option is available ~~enboard~~on-board)

7.14.1 Changing-over from GSM-R to GSM-Public

When the connection to the GSM-R network is lost, the driver shall select an alternate GSM public network if authorised to do so according to instructions previously given by the signaller or provided in the rule and/or route book, unless the ~~enboard~~on-board GSM-R terminal is configured to carry out an automatic network selection.

Driver and signaller shall apply non-harmonised rules.

7.14.2 Changing-over from GSM-Public to GSM-R

When instructed by the signaller or through instructions in the rule and/or route book, the driver shall manually select the indicated GSM-R network on the cab radio, unless the ~~enboard~~on-board GSM-R terminal is configured to carry out an automatic network selection.

8. ANNEX A - INTENTIONALLY BLANK

9. ANNEX B – LIST OF ETCS OPERATIONAL TRAIN CATEGORIES

The ETCS operational train categories are listed in the table below:

label	type of train	type of brake	cant deficiency	
PASS 1	passenger train	P	80	
PASS 2			130	
PASS 3			150	
TILT 1	tilting passenger train		165	
TILT 2			180	
TILT 3			210	
TILT 4			225	
TILT 5			245	
TILT 6			275	
TILT 7			300	
FP 1	freight train		G	80
FP 2				100
FP 3				130
FP 4				150
FG 1		80		
FG 2		100		
FG 3		130		
FG 4		150		

10. ANNEX C – TABLE OF REFERENCES TO NON-HARMONISED RULES

The non-harmonised rules which are referenced in the ERTMS operational rules and mentioned in this document are the following and might need to be reflected with further details in the safety management system of the railway undertaking or the infrastructure manager:

Reference	Subject	In charge
5.1.1	Driver's observance of the line in cab-signalling	RU
6.2.4 6.14 6.39	Passing several consecutive ETCS stop markers in SR with only one written order	IM
6.2.4 6.39 6.41.2	Checking route conditions	IM
6.2.4 6.39 6.41.2	Checking necessary restrictions and / or instructions for running in SR	IM
6.2.4 6.39 6.41.2	Checking speed restrictions lower than the maximum speed for SR	IM
6.2.4 6.39 6.41.2	Exempting the driver from running on sight in SR	IM
6.3.1	Manual entry into SH	RU
6.3.3	Running in SH	IM
6.3.6	SH refused by the RBC / SH request failed	IM
6.3.7	Passing a defined border of a shunting area	IM
6.7.1	Announcement of an ETCS level 0 transition	IM

Reference	Subject	In charge
6.7.3	Running in ETCS level 0	IM
6.11.1	Announcement of an ETCS level NTC transition	IM
6.11.3	Running in ETCS level NTC	IM
6.15	Acknowledgement of LS	IM
6.15	Running in LS	IM
6.16	Acknowledgement of UN	IM
6.16	Running in UN	IM
6.17	Acknowledgement of SN	IM
6.17	Running in SN	IM
6.28	Sounding the audible warning device	IM
6.29	Changing the adhesion factor by the driver	RU
6.31	Unplanned movement entering an occupied track section within a station	IM
6.32.1	No track condition received in NL	RU
6.32.2	Performing a tandem movement	RU
6.33.1	Revoking an authorisation for ERTMS train movement	IM
6.34.1	Protecting trains in the event of an emergency situation	IM
6.34.2	Restarting the trains after an emergency situation	IM
6.34.3	Protecting and restarting shunting movements	IM
6.36.2	Running in RV	IM
6.37	Securing trains / shunting movements in case of unintentional movements	RU
6.38	Managing route unsuitability	IM
6.40.1	An acknowledgement for SH is requested after selecting "start"	IM
6.40.2	The train is rejected when preparing a movement	IM
6.41.1	Moving the train backwards after a trip	IM
6.41.2	To continue running after a trip	IM

Reference	Subject	In charge
6.41.4	Trip in SH	IM
6.41.3	No movement required after a trip	IM and RU
6.43	Managing incompatibility between trackside and ETCS on-board	IM
6.45	Managing a balise read error	IM
6.46.1 6.46.3	Incoming ETCS level not available on-board when passing a transition point	IM
6.48 a)	Managing a radio communication failure when SH is requested	IM
6.48 b)	Managing a radio communication failure when a traction unit has to move in NL	IM
6.49	Managing a failure of Self Test	IM
6.50.1	Managing a failure affecting the on-board radio equipment during the preparation of the traction unit	IM
6.50.2	Managing a failure affecting the on-board radio equipment while running	IM
6.51	Managing a DMI with blank screen	IM
6.52	Managing a system failure	IM
6.53	Managing a NTC failure	IM
6.54	Managing a VBC	IM
7.4	Performing a de-registration	RU
7.9	Managing a failure of de-registration	IM
7.10	Taking measures in case the functional number is not available	IM
7.11	Taking measures in case the functional number is already used	IM
7.12	Managing a failure when registering the functional number	IM
7.13.1	Changing-over from GSM-R to GSM-Public	IM
7.14.1	Changing-over from GSM-R to GSM-Public	IM