Appendix A

to Technical Specifications
“Operations and traffic management”

adopted by


ERTMS OPERATIONAL PRINCIPLES AND RULES

(ETCS 2.3.0D and GSM-R 7.0)
# 1. TABLE OF CONTENTS

1. TABLE OF CONTENTS .......................................................................................... 2

2. INTRODUCTION ................................................................................................. 6

   2.1 PURPOSE OF THE DOCUMENT ................................................................. 6

   2.2 SCOPE AND FIELD OF APPLICATION ..................................................... 7

3. REFERENCES, TERMS AND ABBREVIATIONS ............................................. 8

   3.1 REFERENCE DOCUMENTS .......................................................................... 8

   3.2 TERMS & ABBREVIATIONS ...................................................................... 8

4. PRINCIPLES ........................................................................................................... 15

   4.1 PRINCIPLES FOR ETCS ........................................................................... 15

       4.1.1 CAB-SIGNALLING .............................................................................. 15

       4.1.2 KNOWLEDGE OF OPERATING LEVEL .......................................... 15

       4.1.3 OBSERVANCE OF SIGNALLING ..................................................... 15

       4.1.4 WRITTEN ORDERS .......................................................................... 16

       4.1.5 NO AUTHORISATION FOR ERTMS TRAIN MOVEMENT AT THE EXPECTED TIME ... 16

       4.1.6 AUTHORISATION TO START A MOVEMENT IN SR ...................... 17

       4.1.7 SPEED RESTRICTIONS IN SR ......................................................... 17

       4.1.8 AUTHORISATION TO PASS AN EOA ............................................. 17

       4.1.9 TRAINS / SHUNTING MOVEMENTS BEING TRIPPED ....................... 17

       4.2 PRINCIPLES FOR GSM-R ...................................................................... 18

5. ETCS RULES ......................................................................................................... 19

   5.1 PUTTING THE ETCS ON-BOARD INTO SERVICE .................................... 19

   5.2 PREPARING A MOVEMENT ...................................................................... 19

       5.2.1 The traction unit has to move as a train ........................................... 19

       5.2.2 The traction unit has to move in SH ................................................. 19

       5.2.3 The traction unit has to move in NL ................................................ 20

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

   5.3 PERFORMING SHUNTING MOVEMENTS IN SH ..................................... 22

       5.3.1 Manual entry into SH ....................................................................... 22

       5.3.2 Automatic entry into SH ................................................................. 22

       5.3.3 Running in SH ................................................................................ 22

       5.3.4 Intentionally blank ........................................................................... 22

       5.3.5 Exit from SH .................................................................................. 22

       5.3.6 SH not granted ............................................................................... 23

       5.3.7 Passing a defined border of a shunting area .................................... 23
5.4 ENTERING DATA................................................................................................. 24
  5.4.1 Entering train data during train preparation................................................... 24
  5.4.2 Manual change of data.................................................................................... 24
  5.4.3 Change of data by ETCS external sources...................................................... 25
5.5 RUNNING ON SIGHT.......................................................................................... 26
5.6 DEPARTURE OF THE TRAIN.............................................................................. 26
5.7 ENTERING AND OPERATING IN LEVEL 0 ...................................................... 27
  5.7.1 Announcement .............................................................................................. 27
  5.7.2 Acknowledgement.......................................................................................... 27
  5.7.3 Running........................................................................................................... 27
5.8 ENTERING AND OPERATING IN LEVEL 1 ...................................................... 28
  5.8.1 Announcement .............................................................................................. 28
  5.8.2 Acknowledgement.......................................................................................... 28
  5.8.3 Running........................................................................................................... 28
5.9 ENTERING AND OPERATING IN LEVEL 2 ...................................................... 29
  5.9.1 Announcement .............................................................................................. 29
  5.9.2 Acknowledgement.......................................................................................... 29
  5.9.3 Running........................................................................................................... 29
5.10 ENTERING AND OPERATING IN LEVEL STM............................................... 30
  5.10.1 Announcement .............................................................................................. 30
  5.10.2 Acknowledgement.......................................................................................... 30
  5.10.3 Running........................................................................................................... 30
5.11 RUNNING IN FS................................................................................................. 31
5.12 RUNNING IN OS................................................................................................. 32
5.13 RUNNING IN SR................................................................................................. 33
5.14 INTENTIONALLY BLANK.................................................................................. 33
5.15 RUNNING IN UN................................................................................................. 34
5.16 RUNNING IN SN................................................................................................. 34
5.17 APPROACHING AN EOA WITH A RELEASE SPEED INDICATION.................... 35
5.18 MANAGING A TRACK AHEAD FREE REQUEST.............................................. 35
5.19 PASSING A SECTION WITH LOWERED PANTOGRAPH(S)............................. 36
5.20 PASSING A SECTION WITH TRACTION POWER SWITCHED OFF................... 37
5.21 PASSING A NON STOPPING AREA.................................................................... 38
5.22 PASSING A SECTION WITH INHIBITION OF MAGNETIC SHOE BRAKE........ 39
5.23 PASSING A SECTION WITH INHIBITION OF EDDY CURRENT BRAKE........... 40
5.24 PASSING A SECTION WITH INHIBITION OF REGENERATIVE BRAKE.......... 41
5.25 PASSING A PRESSURE SEAL SECTION........................................................... 42
5.26 CHANGING OF ADHESION FACTOR ........................................................................... 42
5.27 PASSING A RADIO HOLE .......................................................................................... 43
5.28 ENTERING AN OCCUPIED TRACK SECTION WITHIN A STATION ...................... 43
5.29 PERFORMING A TANDEM MOVEMENT .................................................................. 43
5.30 REVOKING AN AUTHORISATION FOR ERTMS TRAIN MOVEMENT .................. 44
5.31 TAKING MEASURES IN THE EVENT OF AN EMERGENCY .................................... 44
  5.31.1 To protect the trains ............................................................................................. 44
  5.31.2 To restart the trains ............................................................................................. 45
  5.31.3 To protect and restart shunting movements ....................................................... 45
5.32 PROPELLING IN RV .................................................................................................. 46
  5.32.1 Preparation of the movement to be performed in RV ........................................... 46
  5.32.2 Running in RV ..................................................................................................... 46
  5.32.3 Intentionally blank ............................................................................................... 46
  5.32.4 Exit from RV ....................................................................................................... 46
5.33 REACTING TO UNINTENTIONAL MOVEMENTS ..................................................... 47
5.34 MANAGING ROUTE UNSUITABILITY ........................................................................ 47
5.35 AUTHORISING THE PASSING OF AN EOA ............................................................ 48
5.36 REACTING TO UNEXPECTED SITUATIONS WHEN PREPARING A TRAIN MOVEMENT .................................................................................................................. 49
  5.36.1 The traction unit has to move as a train but an acknowledgement for SH is requested ... 49
  5.36.2 The train is rejected ............................................................................................. 49
5.37 RESPONDING TO A TRIP ............................................................................................ 50
  5.37.1 Immediate measures ............................................................................................ 50
  5.37.2 To continue running .............................................................................................. 51
  5.37.3 No movement required after a trip ....................................................................... 52
  5.37.4 Trip in SH when passing a defined border of a shunting area ................................ 52
5.38 MANAGING INCOMPATIBILITY BETWEEN TRACKSIDE AND ETCS ON-BOARD .. 52
5.39 MANAGING A BALISE READ ERROR ........................................................................ 53
5.40 MANAGING A FAILED LEVEL TRANSITION .......................................................... 54
  5.40.1 If the train has been tripped .................................................................................. 54
  5.40.2 If in SR ................................................................................................................. 54
  5.40.3 In all other cases ................................................................................................... 54
5.41 MANAGING ABSENCE OF RBC INFORMATION ....................................................... 55
5.42 MANAGING A RADIO COMMUNICATION FAILURE .............................................. 55
5.43 MANAGING A FAILURE OF SELF TEST .................................................................... 56
5.44 MANAGING A FAILURE AFFECTING THE ON-BOARD RADIO EQUIPMENT ........ 56
  5.44.1 During the preparation of the traction unit ........................................................... 56
  5.44.2 While running .................................................................................................... 56
5.45 MANAGING A DMI WITH BLANK SCREEN ................................................................. 57
5.46 MANAGING A SYSTEM FAILURE ............................................................................ 57
6. GSM/R RULES ........................................................................................................ 58
   6.1 SELECTING THE GSM-R MODE ........................................................................ 58
   6.2 ENTERING THE FUNCTIONAL NUMBER .............................................................. 58
   6.3 SELECTING THE GSM-R NETWORK AT A BORDER CROSSING ..................... 58
   6.4 PERFORMING A DE-REGISTRATION ................................................................. 58
   6.5 TAKING MEASURES IN CASE OF AN EMERGENCY CALL ............................... 59
   6.6 MANAGING A FAILURE OF SELF TEST ............................................................. 59
   6.7 MANAGING A LACK OF NETWORK ...................................................................... 59
   6.8 MANAGING A FAILURE OF THE GSM-R ON-BOARD WHILE RUNNING .......... 59
   6.9 MANAGING A FAILURE OF DE-REGISTRATION ............................................... 59
   6.10 TAKING MEASURES IN CASE THE FUNCTIONAL NUMBER IS NOT AVAILABLE .. 60
   6.11 TAKING MEASURES IN CASE THE FUNCTIONAL NUMBER IS ALREADY USED .. 60
   6.12 MANAGING A FAILURE WHILE ENTERING THE FUNCTIONAL NUMBER .......... 60
7. ANNEX A – ERTMS WRITTEN ORDERS .................................................................... 61
8. ANNEX B – LIST OF ETCS OPERATIONAL TRAIN CATEGORIES ............................ 69
9. ANNEX C – TABLE OF LINKED NON-HARMONISED RULES ................................. 70
2. INTRODUCTION

2.1 PURPOSE 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.

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

Annex A contains the different ERTMS written orders.

Annex B contains the different ETCS operational train categories.

Annex C contains the list of linked 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.
2.2 SCOPE AND FIELD OF APPLICATION

The scope is the following:

- ETCS level 1 application whether or not trackside signals or infill are present,
- ETCS level 2 application,
- ETCS transitions between level 1 and level 2 applications,
- GSM-R.

The following items are out of scope:

- ETCS level 0 application (and transitions to / from another level),
- ETCS level 1 or ETCS level 2 with an underlying system,
- ETCS level 3 application (and transitions to from another level),
- ETCS level STM applications (and transitions to / from another level).

The rules have been developed independently of other rail traffic management systems that may be present including where lines are equipped with ETCS level 1 and ETCS level 2.

When ETCS level 1 or ETCS level 2 are implemented on lines fitted with other rail traffic management 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 2.

The ETCS operational rules also cover the transitions ordered from trackside between the levels mentioned above.

Some situations however require taking into account information displayed on the DMI referring to ETCS level 0 or ETCS level STM.

GSM-R voice radio operational rules are applicable on lines equipped with GSM-R independently of the control command system in use.
3. REFERENCES, TERMS AND ABBREVIATIONS

3.1 REFERENCE DOCUMENTS

Table 1 : reference documents

<table>
<thead>
<tr>
<th>Ref. N°</th>
<th>Document Reference</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>[5]</td>
<td>PSA167D005</td>
<td>FRS 7.0 GSM-R</td>
</tr>
</tbody>
</table>

3.2 TERMS & ABBREVIATIONS

Table 2 : Terms

<table>
<thead>
<tr>
<th>Term</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acknowledgement</td>
<td>Confirmation given by the driver to a request from the ETCS on-board that he has received information he needs to take into account.</td>
</tr>
</tbody>
</table>
| Applicable speed limit (in SR)          | The lowest speed limit of:  
• maximum train speed,  
• timetable / Route Book,  
• temporary speed restrictions (transmitted by other means than written order),  
• written order,  
• maximum speed for SR. |


<table>
<thead>
<tr>
<th><strong>Term</strong></th>
<th><strong>Definition</strong></th>
</tr>
</thead>
</table>
| Authorisation for ERTMS train movement | Permission for a train to move given by means of:  
  - a trackside signal at proceed aspect or,  
  - an MA or,  
  - a written order:  
    - to start in SR after preparing a movement or,  
    - to pass an EOA 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. |
| Controller | For the purpose of this document a person in charge of the operational communication using GSM-R. |
| De-registration | Action that can be initiated by the user of a GSM-R radio, by automatic systems or by the network authority, to change the status of a GSM-R radio to de-registered. The de-registration allows the de-registered train number to be re-used by another train. |
| Driver Machine Interface (DMI) | Train device to enable communication between the ETCS on-board and the driver. |
| Emergency call | Call set up in some dangerous situations to warn all trains / shunting movements equipped with GSM-R in a defined area. |
| 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 the train is authorised to proceed and where the target speed is zero. |
| ETCS location marker | Harmonised trackside ETCS signal to identify a specific location on the line. |
### Table 2: Terms

<table>
<thead>
<tr>
<th>Term</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>ETCS on-board</td>
<td>The part of ETCS installed on a railway vehicle.</td>
</tr>
<tr>
<td>ETCS stop marker</td>
<td>Harmonised trackside ETCS signal to indicate the location where a train running in SR has to stop.</td>
</tr>
<tr>
<td>ETCS operational train category</td>
<td>Set of technical and / or operational characteristics of a train to which a specific ETCS speed profile applies.</td>
</tr>
</tbody>
</table>
| Functional number (GSM-R)                 | 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. The functional number can be divided into two parts:  
- 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 controller – based on the current location of the user – typically a train). |
| GSM-R mode                                | Status of the GSM-R on-board which provides functions for:  
- train movement,  
- or shunting movement.                                                                   |
<p>| GSM-R network                             | Radio network which provides GSM-R functions.                                                                                            |
| GSM-R network marker                      | Harmonised trackside GSM-R signal 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 trackside in RV.                                                                                             |
| Maximum speed for SR                      | Maximum speed given from the trackside in SR.                                                                                             |</p>
<table>
<thead>
<tr>
<th>Term</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Movement Authority (MA)</td>
<td>Permission for a train to move to a specific location with supervision of speed.</td>
</tr>
<tr>
<td>Non stopping area</td>
<td>Area defined by the Infrastructure Manager where it may not be safe or suitable to stop a train.</td>
</tr>
<tr>
<td>Override EOA speed</td>
<td>Maximum speed when the override EOA function is active.</td>
</tr>
<tr>
<td>Permitted speed</td>
<td>Maximum speed at which a train / shunting movement can run without ETCS warning and / or brake intervention.</td>
</tr>
<tr>
<td>Proceed aspect</td>
<td>Any signal aspect which permits the driver to pass the signal.</td>
</tr>
<tr>
<td>Propelling</td>
<td>Movement of a train where the driver is not in the leading cab of the leading vehicle.</td>
</tr>
<tr>
<td>Radio communication</td>
<td>Exchange of information between the ETCS on-board and the RBC / radio infill unit.</td>
</tr>
<tr>
<td>Radio Block Centre (RBC)</td>
<td>ETCS trackside centralised unit controlling ETCS train movements in level 2.</td>
</tr>
<tr>
<td>Radio hole</td>
<td>A pre-defined area where it is not possible to establish a reliable radio communication channel.</td>
</tr>
<tr>
<td>Registration</td>
<td>Temporary relationship between the telephone number and the train running number.</td>
</tr>
<tr>
<td>Release speed</td>
<td>Maximum speed at which a train is allowed to reach the end of its Movement Authority.</td>
</tr>
<tr>
<td>Revocation of MA</td>
<td>Withdrawal of a previous given MA.</td>
</tr>
<tr>
<td>Term</td>
<td>Definition</td>
</tr>
<tr>
<td>----------------------</td>
<td>-------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Route Book</td>
<td>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.</td>
</tr>
<tr>
<td>Scheduled stop</td>
<td>Planned stop for commercial or operational reasons.</td>
</tr>
<tr>
<td>Securing</td>
<td>Measures to be applied to avoid unintentional movement of railway vehicles.</td>
</tr>
<tr>
<td>Shunting movement</td>
<td>Way of moving vehicles without train data and controlled by shunting orders.</td>
</tr>
<tr>
<td>Signaller</td>
<td>Performer in charge of the route setting of trains / shunting movements and of issuing instructions to drivers.</td>
</tr>
<tr>
<td>Stop aspect</td>
<td>Any signal aspect that does not allow the driver to pass the signal. A stop aspect includes trackside signals and hand signals.</td>
</tr>
<tr>
<td>Tandem</td>
<td>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.</td>
</tr>
<tr>
<td>Temporary speed restriction</td>
<td>Reduction of the line speed for a limited period of time.</td>
</tr>
<tr>
<td>Text message</td>
<td>Information in writing displayed on the DMI.</td>
</tr>
<tr>
<td>Train data</td>
<td>Information which describes the characteristics of a train.</td>
</tr>
<tr>
<td>Train preparer</td>
<td>Performer in charge of the preparation of a train.</td>
</tr>
<tr>
<td>Transition</td>
<td>Controlled change between the different ETCS levels.</td>
</tr>
<tr>
<td>Transition point</td>
<td>Point where a transition between ETCS levels takes place.</td>
</tr>
<tr>
<td>Term</td>
<td>Definition</td>
</tr>
<tr>
<td>---------------</td>
<td>----------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Trip</td>
<td>Irrevocable application of the emergency brakes by ETCS until the train / shunting movement is at a standstill.</td>
</tr>
<tr>
<td>Written order</td>
<td>Instruction issued by the signaller to the driver.</td>
</tr>
</tbody>
</table>
Table 3: Abbreviations

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>DMI</td>
<td>Driver Machine Interface</td>
</tr>
<tr>
<td>EOA</td>
<td>End Of Authority</td>
</tr>
<tr>
<td>ERTMS</td>
<td>European Rail Traffic Management System</td>
</tr>
<tr>
<td>ETCS</td>
<td>European Train Control System</td>
</tr>
<tr>
<td>G</td>
<td>Goods train braking mode</td>
</tr>
<tr>
<td>GSM-R</td>
<td>Global System for Mobile communication - Railway</td>
</tr>
<tr>
<td>MA</td>
<td>Movement Authority</td>
</tr>
<tr>
<td>P</td>
<td>Passenger train braking mode</td>
</tr>
<tr>
<td>RBC</td>
<td>Radio Block Centre</td>
</tr>
<tr>
<td>STM</td>
<td>Specific Transmission Module</td>
</tr>
<tr>
<td>FS, NL, OS, RV, SH, SN, SR, UN</td>
<td>ETCS status indications</td>
</tr>
</tbody>
</table>
4. **PRINCIPLES**

4.1 **PRINCIPLES FOR ETCS**

4.1.1 **CAB-SIGNALLING**

Cab signalling provides movement authorities to trains; these movement authorities are displayed on a DMI installed in the driver’s cab. The driver shall observe the displayed information on the DMI and shall react as required by the operational rules; the operational rules (including non-harmonised rules) could require him at times to look outside.

4.1.2 **KNOWLEDGE OF OPERATING LEVEL**

Before applying an ETCS rule that is particular to a specific operating level the signaller shall ascertain what level the concerned train is operating in.

4.1.3 **OBSERVANCE OF SIGNALLING**

The driver shall obey the indications displayed on the DMI. If no action is required from the driver the corresponding information to be displayed on the DMI is not contained in the rules.
4.1.4 **WRITTEN ORDERS**

A written order takes precedence over the related indications provided by the DMI except when a lower permitted speed or a lower release speed is displayed.

A written order should be issued as close as practicable to the affected area.

A written order must only be issued when the driver has identified the train running number and the location of the train.

A written order must state the following as a minimum:

- from where it was issued (signal box...),
- at what time and date it was issued,
- to which train / shunting movement it refers,
- where that train / shunting movement is located,
- at which location it applies,
- clear, precise, unambiguous instructions,
- an authorisation number.

A written order may be transmitted physically on paper or as verbal instructions to the driver to write down.

When the driver receives a written order he shall check that this written order refers to his train / shunting movement and its current location.

A written order that has been issued can only be revoked by a new written order explicitly referring to the previous one.

4.1.5 **NO AUTHORISATION FOR ERTMS TRAIN MOVEMENT AT THE EXPECTED TIME**

If the driver has not received an authorisation for ERTMS train movement at the expected time, and has no information as to the reason, he shall inform the signaller about the situation in accordance with non-harmonised rules.
4.1.6 AUTHORISATION TO START A MOVEMENT IN SR
The driver shall be authorised by the signaller to start a movement in SR by means of written order, except in case of starting a movement in level 1 with trackside signals.

4.1.7 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 written order except if the driver is informed by a dedicated document/computer medium about these speed limitations.

4.1.8 AUTHORISATION TO PASS AN EOA
The driver shall only be authorised to pass an EOA by the signaller by means of written order.

4.1.9 TRAINS / SHUNTING MOVEMENTS BEING TRIPPED
After a trip has occurred the driver shall only continue running in the same direction if he has received permission by written order from the signaller.
4.2 PRINCIPLES FOR GSM-R

Intentionally blank.
5. ETCS RULES

5.1 PUTTING THE ETCS ON-BOARD INTO SERVICE

The driver switches the ETCS on-board on.
Levels 0, 1, 2, STM

When requested by the ETCS on-board, the driver shall enter, re-enter or re-validate the driver identification, the level, the radio network identification and the RBC identification / phone number.

5.2 PREPARING A MOVEMENT

The ETCS on-board is in service.
Levels 0, 1, 2, STM

In level 2, in case the train is rejected the driver shall apply rule “reacting to unexpected situations when preparing a train movement” (section 6.36.2).

5.2.1 The traction unit has to move as a train

The driver shall:

- apply rule “entering data” (section 6.4.1),
- select “Start”.

In case an acknowledgement for SR is requested in level 1 without trackside signals and in level 2, the driver shall apply section 6.2.4.

In case an acknowledgement for SH is requested in level 2, the driver shall apply rule “reacting to unexpected situations when preparing a train movement” (section 6.36.1).

5.2.2 The traction unit has to move in SH

The driver shall prepare for shunting and apply rule “performing shunting movements in SH”.
5.2.3 The traction unit has to move in NL

The driver of the non leading engine shall prepare for tandem movement and apply rule “performing a tandem movement”.

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

| Levels 1 without trackside signals, 2 |

When the following symbol is displayed with a flashing frame:

the driver shall inform the signaller about the situation.

Before acknowledging the driver shall receive permission to start in SR from the signaller by means of ETCS Written Order 07.

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 ETCS Written Order 07,
- check for temporary speed restrictions to be included in ETCS Written Order 07.

If the train is not in front of an ETCS stop marker this authorisation is valid from the current location of the train to the next ETCS stop marker.

If the train is in front of 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 by means of ETCS Written Order 07.
The driver shall:

- receive ETCS Written Order 07 from the signaller,
- check the applicable speed limit,
- use the override function if requested,
- and when the following symbol is displayed:

  ![Symbol]

  - start the train,
  - respect 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.

If the signaller can establish that the track is free then he can exempt the driver from running on sight in SR according to non-harmonised rules.
5.3 PERFORMING SHUNTING MOVEMENTS IN SH

Rolling stock has to be moved in SH.
Levels 1, 2

5.3.1 Manual entry into SH
The driver shall select “Shunting” according to non-harmonised rules.

5.3.2 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.

5.3.3 Running in SH
When the following symbol is displayed:

the driver shall apply non-harmonised rules.

5.3.4 Intentionally blank

5.3.5 Exit from SH
When all shunting movements to be performed in SH are finished the driver shall select “Exit Shunting”.

5.3.6  **SH not granted**

**Level 2**

When the following text message is displayed:

```
“SH refused”,
```

the driver shall inform the signaller about the situation.

Driver and signaller shall apply non-harmonised rules.

5.3.7  **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.
5.4 ENTERING DATA

Data have to be entered or modified.
Levels 0, 1, 2, STM

5.4.1 Entering train data during train preparation
The train preparer shall enter / modify all of the following data except the data that is pre-configured on-board or received from ETCS external sources that are not modifiable by the driver:

- ETCS operational train category,
- train length,
- deceleration data,
- maximum train speed,
- axle load,
- train fitted with airtight system,
- additional data for the available STMs,
- train running number.

Before confirming 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 match.

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

- determine the new data,
- enter the new data,
- validate the new data.
5.4.3 Change of 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,
- take into account the modified data.

In level 1, and in level 2 if no new MA is received, the signaller shall authorise the driver to pass the EOA (rule “authorising the passing of an EOA”).

b) in all other cases

The driver shall take into account the modified data.
5.5 RUNNING ON SIGHT

The driver has to run on sight from an operational point of view, regardless of the ETCS status indication.

Levels 1, 2

When a driver has to run on sight, he shall:

- proceed with caution, controlling his speed, taking into account the line visible in advance, such that it is possible to stop short of any vehicle, EOA, stop aspect or obstacle,
- respect the maximum speed for running on sight.

5.6 DEPARTURE OF THE TRAIN

The train is about to start at the initial station or after a scheduled stop.

Levels 1, 2

The driver is allowed to depart when the following conditions are fulfilled:

- after he has received an authorisation for ERTMS train movement,
- after train service conditions are fulfilled according to non-harmonised rules,
- when it is time to depart, except when allowed to start before the scheduled time.
5.7 ENTERING AND OPERATING IN LEVEL 0

5.7.1 Announcement

The train is approaching a level 0 area.
Levels 1, 2

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

the driver shall apply non-harmonised rules.

5.7.2 Acknowledgement

When the following symbol is displayed with a flashing frame:

the driver shall acknowledge.

5.7.3 Running

The train is running in a level 0 area.

When the following symbol is displayed:

the driver shall apply non-harmonised rules.
5.8 ENTERING AND OPERATING IN LEVEL 1

5.8.1 Announcement

The train is approaching a level 1 area.

When a transition to level 1 is announced by displaying the following symbol:

the driver shall prepare to apply rules for level 1.

5.8.2 Acknowledgement

When the following symbol is displayed with a flashing frame:

the driver shall acknowledge.

5.8.3 Running

The train is running in a level 1 area.

When the following symbol is displayed:

the driver shall apply rules according to level 1.
5.9 ENTERING AND OPERATING IN LEVEL 2

5.9.1 Announcement
The train is approaching a level 2 area.
Level 1

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

the driver shall prepare to apply rules for level 2.

5.9.2 Acknowledgement
When the following symbol is displayed with a flashing frame:

the driver shall acknowledge.

5.9.3 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.
5.10 ENTERING AND OPERATING IN LEVEL STM

5.10.1 Announcement

The train is approaching a level STM area.
Levels 1, 2

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

the driver shall apply non-harmonised rules.

5.10.2 Acknowledgement

When the following symbol is displayed with a flashing frame:

the driver shall acknowledge.

5.10.3 Running

The train is running in a level STM area.

When the following symbol is displayed:

the driver shall apply non-harmonised rules.
5.11 RUNNING IN FS

Levels 1, 2

When the following symbol is displayed:

the driver shall respect the permitted speed.

If in addition the following text message is displayed:

“Entering FS”

the driver shall respect speed restrictions that apply for the part of the train that is not covered by the FS MA.
5.12  RUNNING IN OS

| Levels 1, 2 |

When the following symbol is displayed with a flashing frame:

![Symbol]

the driver shall:

• acknowledge,
• start or continue running on sight.

When the following symbol is displayed:

![Symbol]

the driver shall:

• run on sight as long as this symbol is displayed,
• respect the permitted speed.

If in addition the following text message is displayed:

“Entering OS”

the driver shall respect speed restrictions that apply for the part of the train that is not covered by the OS MA.
5.13  **RUNNING IN SR**

| Levels 1, 2 |

When the following symbol is displayed with a flashing frame:

![Symbol](image1)

the driver shall:

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

When the following symbol is displayed:

![Symbol](image2)

the driver shall:

- run on sight, unless a written order exempts him from running on sight in SR,
- respect the applicable speed limit,
- in level 2 and in level 1 without trackside signal stop at the next ETCS stop marker, 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 written order.

5.14  **INTENTIONALLY BLANK**
5.15  **RUNNING IN UN**

| Level 0 |

When the following symbol is displayed with a flashing frame:

![Symbol](symbol1.png)

the driver shall acknowledge according to non-harmonised rules.

When the following symbol is displayed:

![Symbol](symbol2.png)

the driver shall apply non-harmonised rules.

5.16  **RUNNING IN SN**

| Level STM |

When the following symbol is displayed with a flashing frame:

![Symbol](symbol3.png)

the driver shall acknowledge according to non-harmonised rules.

When the following symbol is displayed:

![Symbol](symbol4.png)

the driver shall apply non-harmonised rules.
5.17 APPROACHING AN EOA WITH A RELEASE SPEED INDICATION

Levels 1, 2

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

- to approach a signal or a buffer stop which is a short distance behind the EOA indicated on the DMI without exceeding the release speed,
- in level 1 to proceed without exceeding the release speed when the trackside signal shows a proceed aspect.

5.18 MANAGING A TRACK AHEAD FREE REQUEST

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

Level 2

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 ETCS stop marker / ETCS location marker is free.
5.19 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

When the following symbol is displayed:

\[\text{Symbol}\]

the driver shall lower the pantograph(s).

When the following symbol is displayed:

\[\text{Symbol}\]

the driver shall keep the pantograph(s) lowered.

When the following symbol is displayed:

\[\text{Symbol}\]

the driver is authorised to raise the pantograph(s), taking into account their positions.
5.20 PASSING A SECTION WITH TRACTION POWER SWITCHED OFF

The train is approaching a section of the line to be passed with traction power switched off.

When the following symbol is displayed:

![Symbol]

the driver shall shut off traction power.

When the following symbol is displayed:

![Symbol]

the driver shall keep the traction power shut off.

When the following symbol is displayed:

![Symbol]

the driver is authorised to apply traction power again, taking into account the position of the pantographs.
5.21 PASSING A NON STOPPING AREA

The train is approaching a non stopping area.

Levels 1, 2

When the following symbol is displayed:

the driver shall avoid stopping in the announced non stopping area.

When the following symbol is displayed:

the driver shall avoid stopping.
5.22 PASSING A SECTION WITH INHIBITION OF MAGNETIC SHOE BRAKE

<table>
<thead>
<tr>
<th>Levels 1, 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>The train is approaching a section of the line where the magnetic shoe brake shall not be used.</td>
</tr>
</tbody>
</table>

When the following symbol is displayed:

![Symbol](image)

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

When the following symbol is displayed:

![Symbol](image)

the driver shall not use the magnetic shoe brake except in case of an emergency situation.
5.23 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

When the following symbol is displayed:

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

When the following symbol is displayed:

the driver shall not use the eddy current brake except in case of an emergency situation.
5.24 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

When the following symbol is displayed:

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

When the following symbol is displayed:

the driver shall not use the regenerative brake except in case of an emergency situation.
5.25  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

When the following symbol is displayed:

the driver shall close the air conditioning intakes.

When the following symbol is displayed:

the driver shall keep the air conditioning intakes closed.

When the following symbol is displayed:

the driver is authorised to open the air conditioning intakes.

5.26  CHANGING OF ADHESION FACTOR

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

Levels 1, 2

When the following symbol is displayed:

the driver shall apply non-harmonised rules.
5.27 PASSING A RADIO HOLE

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

Level 2

When the following symbol is displayed:

the driver shall apply non-harmonised rules.

5.28 ENTERING AN OCCUPIED TRACK SECTION WITHIN A STATION

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

Levels 1, 2

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.

In case of an unplanned movement, before setting the route, the signaller shall inform the drivers of both trains involved of the circumstances in accordance with non-harmonised rules.

The driver of the train that has to enter the occupied track shall follow the instructions received from the signaller.

5.29 PERFORMING A TANDEM MOVEMENT

Intentionally blank.
5.30 REVOKING AN AUTHORISATION FOR ERTMS TRAIN MOVEMENT

The signaller decides to change existing traffic arrangements.

Levels 1, 2

If possible in level 2 the signaller shall revoke an MA by the use of the co-operative shortening of MA.

In all other cases, the signaller shall apply non-harmonised rules.

When non-harmonised rules stipulate that a train has to be at a standstill before making traffic arrangements, the signaller shall order the driver to remain at a standstill by means of ETCS Written Order 03.

To restart the trains the signaller shall:

- issue an authorisation for ERTMS train movement,
- issue ETCS Written Order 04 in order to revoke ETCS Written Order 03.

5.31 TAKING MEASURES IN THE EVENT OF AN EMERGENCY

An emergency situation occurs.

Levels 1, 2

5.31.1 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 according to non-harmonised rules.

To stop trains in level 2, he 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.

When the following text message is displayed:
“Emergency stop”
the driver shall apply rule “responding to a trip”.

5.31.2 To restart the trains
According to non-harmonised rules, the signaller shall:

- decide if it is possible to authorise train movement,
- decide if instructions and / or restrictions for train movement are necessary,
- if an emergency stop order has been issued revoke it,
- 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 ETCS Written Order 05. In 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 (rule “responding to a trip”). The signaller shall include necessary instructions and / or restrictions for train movement according to non-harmonised rules in ETCS Written Order 02.

5.31.3 To protect and restart shunting movements
The signaller and the driver shall apply non-harmonised rules.
5.32 PROPELLING IN RV

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

Levels 1, 2

5.32.1 Preparation of the movement to be performed in RV

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

[Symbol]

the driver shall trigger the transition to RV.

5.32.2 Running in RV

When the following symbol is displayed with a flashing frame:

[Symbol]

the driver shall:

- acknowledge,
- propel the train according to non-harmonised rules as soon as the following symbol is displayed:

[Symbol]

- respect the maximum speed for RV,
- respect the permitted distance to run.

5.32.3 Intentionally blank

5.32.4 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.
5.33 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

When the following text message is displayed:

“Runaway movement”,

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

5.34 MANAGING ROUTE UNSUITABILITY

Levels 1, 2

When a route unsuitability is detected driver and signaller shall apply non-harmonised rules.
5.35 AUTHORISING THE PASSING OF AN EOA

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

Levels 1, 2

Before authorising a driver to pass an EOA by means of ETCS Written Order 01 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 ETCS Written Order 01,
- check for temporary speed restrictions to be included in ETCS Written Order 01.

If the signaller can establish that the track is free then he can exempt the driver from running on sight in SR according to non-harmonised rules.

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

To pass the EOA, the driver shall:

- receive ETCS Written Order 01 from the signaller,
- check the applicable speed limit,
- use the override function,
- and when the following symbol is displayed:

- start the train,
- respect the override EOA speed while this symbol is displayed.
5.36 REACTING TO UNEXPECTED SITUATIONS WHEN PREPARING A TRAIN MOVEMENT

5.36.1 **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:

![Symbol](image)

before to acknowledge the driver shall inform the signaller about the situation.

The signaller shall:
- decide on how to proceed,
- inform the driver about the way to proceed.

Driver and signaller shall apply non-harmonised rules.

5.36.2 **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.
5.37 RESPONDING TO A TRIP

A train or a shunting movement is tripped.
Levels 1, 2

5.37.1 Immediate measures

When the following symbol is displayed:

the driver shall assume that there is a 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.

a) In case a backward movement is necessary

When, in accordance with non-harmonised rules, the driver decides to move the train / shunting movement backwards 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.

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,
- can release the emergency brake.

5.37.2 To continue running

Before giving permission to the driver to proceed after a trip by means of ETCS Written Order 02 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 ETCS Written Order 02,
- check for temporary speed restrictions to be included in ETCS Written Order 02.

If the signaller can establish that the track is free then he can exempt the driver of a train from running on sight in SR if allowed by non-harmonised rules.

To proceed the driver shall:

- receive ETCS Written Order 02 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 ETCS Written Order 02,
- restart the train / shunting movement.
If in level 2, 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 (rule “authorising the passing of an EOA”). In this case, ETCS Written Order 01 shall be issued by the signaller in place of ETCS Written Order 02.

5.37.3 No movement required after a trip

In the case of a train / shunting movement not required to be moved after a trip, the signaller shall order the driver to select “Start” / “SH” and close the driving desk by means of ETCS Written Order 02 using the additional instructions section.

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

Level 2

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

5.38 MANAGING INCOMPATIBILITY BETWEEN TRACKSIDE AND ETCS ON-BOARD

An incompatibility between trackside and ETCS on-board occurs and the brakes are triggered by the ETCS on-board (the train is not tripped).

Levels 1, 2

When the following text message is displayed:

“Trackside not compatible”,

the driver shall inform the signaller about the situation.

Driver and signaller shall apply non-harmonised rules.
5.39 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

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.

In level 1, and in level 2 if no new MA is received, when the train has come to a standstill, the signaller shall authorise the driver to pass the EOA (rule “authorising the passing of an EOA”).

If the situation is repeated driver and signaller shall apply non-harmonised rules.
### 5.40 MANAGING A FAILED LEVEL TRANSITION

The transition does not take place when passing the transition point.

| Levels 1, 2 |

---

#### 5.40.1 If the train has been tripped

The driver and the signaller shall take measures in response of a trip (rule “responding to a trip”).

After selecting “Start” the driver shall:
- check the correct ETCS level to be selected,
- change the ETCS level (rule “entering data” (section 6.4.2)),

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.

#### 5.40.2 If in SR

The driver shall:
- stop the train,
- apply the following section 6.40.3.

#### 5.40.3 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 “entering data” (section 6.4.2)),

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.
5.41 MANAGING ABSENCE OF RBC INFORMATION

<table>
<thead>
<tr>
<th>Level 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>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).</td>
</tr>
</tbody>
</table>

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 (rule “authorising the passing of an EOA”).

5.42 MANAGING A RADIO COMMUNICATION FAILURE

<table>
<thead>
<tr>
<th>Levels 0, 1, 2, STM</th>
</tr>
</thead>
<tbody>
<tr>
<td>An ETCS radio communication failure occurs.</td>
</tr>
</tbody>
</table>

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 “entering data” (section 6.4.2)).

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

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

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

b) in all other cases

The signaller shall authorise the driver to pass the EOA (rule “authorising the passing of an EOA”).
5.43 MANAGING A FAILURE OF SELF TEST

Levels 0, 1, 2, STM

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 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.

5.44 MANAGING A FAILURE AFFECTING THE ON-BOARD RADIO EQUIPMENT

Levels 0, 1, 2, STM

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

5.44.1 During the preparation of the traction unit

In level 2 the driver shall request a change of traction unit. If the traction unit must be moved, driver and signaller shall apply non-harmonised rules.

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

5.44.2 While running

In level 1 with infill function by radio and in level 2 driver and signaller shall apply non-harmonised rules.
5.45 MANAGING A DMI WITH BLANK SCREEN

The DMI fails and shows a blank screen.
Levels 0, 1, 2, STM

When the DMI fails and shows a blank screen the driver shall inform the signaller about the situation.

Driver and signaller shall apply non-harmonised rules.

5.46 MANAGING A SYSTEM FAILURE

Levels 0, 1, 2, STM

When the following symbol is displayed:

⚠️

the driver shall inform the signaller about the situation.

Driver and signaller shall apply non-harmonised rules.
6. GSM/R RULES

6.1 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.

6.2 ENTERING THE FUNCTIONAL NUMBER

The train preparer 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.

6.3 SELECTING THE GSM-R NETWORK AT A BORDER CROSSING

The train is approaching a border crossing.

When according to the Route Book or a GSM-R network marker the driver has to select a new GSM-R network, he shall start the selection process unless he is engaged in an emergency call.

6.4 PERFORMING A DE-REGISTRATION

The train is leaving a GSM-R network or has ended its journey and has to be manually de-registered.

The driver shall carry out the de-registration.
6.5   TAKING MEASURES IN CASE OF AN EMERGENCY CALL

| The driver has received an emergency call. |

Driver and controller shall apply non-harmonised rules.

6.6   MANAGING A FAILURE OF SELF TEST

When the following text message is displayed:

“Self test failed”,

the driver shall inform the controller about the situation.

Driver and controller shall apply non-harmonised rules.

6.7   MANAGING A LACK OF NETWORK

When the following text message is displayed:

“No network”,

the driver shall inform the controller about the situation.

Driver and controller shall apply non-harmonised rules.

6.8   MANAGING A FAILURE OF THE GSM-R ON-BOARD WHILE RUNNING

The driver shall inform the controller about the situation.

Driver and controller shall apply non-harmonised rules.

6.9   MANAGING A FAILURE OF DE-REGISTRATION

If the de-registration is not possible the driver shall inform the controller about the situation.

Driver and controller shall apply non-harmonised rules.
6.10 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.

If the registration fails again, he shall inform the controller about the situation.

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

6.11 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 correct number and inform the controller if the number is correct.

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

6.12 MANAGING A FAILURE WHILE ENTERING THE FUNCTIONAL NUMBER

When it is not possible to enter the functional number, the train preparer / driver shall inform the controller about the situation.

Train preparer / driver and controller shall apply non-harmonised rules.
7. **ANNEX A – ERTMS WRITTEN ORDERS**

The information contained in these written orders is mandatory, the presentation is informative (including the numbering of the ETCS written orders).

The different ETCS written orders to be used according to the operational rules are the following:

- ETCS Written Order 01: Permission to pass an EOA,
- ETCS Written Order 02: Permission to proceed after a trip,
- ETCS Written Order 03: Obligation to remain at a standstill,
- ETCS Written Order 04: Revocation of ETCS Written Order 03,
- ETCS Written Order 05: Obligation to run under restrictions,
- ETCS Written Order 06: (reserved),
- ETCS Written Order 07: Permission to start in SR after preparing a movement.
**PERMISSION TO PASS AN EOA**

<table>
<thead>
<tr>
<th>Signal box:</th>
<th>Date:</th>
<th>Time:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>....../....../......</td>
<td>...... : ......</td>
</tr>
<tr>
<td></td>
<td>(dd / mm / yy)</td>
<td>(hh : mm)</td>
</tr>
</tbody>
</table>

**Train Running Number:** .................

at: .............................. on track: .................
(km / signal)

1  □ is allowed to pass EOA at: ..............................
(km / signal)

2  □ run with maximum speed of:

  .......... km/h from .............................. to ..............................
(km / signal) (km / signal)

  and  .......... km/h from .............................. to ..............................
(km / signal) (km / signal)

  and  .......... km/h from .............................. to ..............................
(km / signal) (km / signal)

3  □ is exempted from running on sight

4  □ additional instructions: ..............................

Authorisation Number: ..............................

*Mark with a cross the boxes of the sections that shall become valid (X).*

*In the valid sections fill in the information on the dotted lines.*

*Delete non-valid text in brackets (example: km / signal).*
### ETCS Written Order 02

**PERMISSION TO PROCEED AFTER A TRIP**

<table>
<thead>
<tr>
<th>Signal box: ................................</th>
<th>Date: ........../....../......</th>
<th>Time: ........ : ........</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(dd / mm / yy)</td>
<td>(hh : mm)</td>
</tr>
</tbody>
</table>

Train Running Number or Shunting Movement Number: .................

at: ................................ on track: ........

(km / signal)

1 [ ] if no MA received is allowed to start in SR

2 [ ] select SH

3 [ ] run with maximum speed of:

\[
\text{......... km/h from: ................. to: .................}
\]

(km / signal) (km / signal)

and

\[
\text{......... km/h from: ................. to: .................}
\]

(km / signal) (km / signal)

and

\[
\text{......... km/h from: ................. to: .................}
\]

(km / signal) (km / signal)

4 [ ] is exempted from running on sight

5 [ ] examine the line, for the following reason: .................................................................

.................................................................

.................................................................

6 [ ] report findings to: .................................................................

7 [ ] additional instructions: .................................................................

.................................................................

.................................................................

Authorisation Number: ........................................

Mark with a cross the boxes of the sections that shall become valid ( [x] ).

In the valid sections fill in the information on the dotted lines.

Delete non-valid text in brackets (example: km / signal).
OBLIGATION TO REMAIN AT A STANDSTILL

Signal box: ......................... Date: ....../....../......
(dd / mm / yy) Time: ...... : ......
(hh : mm)

Train Running Number: ..................

at: .............................. on track: ........
(km / signal)

1 ☐ remain at a standstill at the current position

2 ☐ additional instructions: ...........................................................
...........................................................
...........................................................

Authorisation Number: ............................

Mark with a cross the boxes of the sections that shall become valid ( ☒ ).
In the valid sections fill in the information on the dotted lines.
Delete non-valid text in brackets (example: km / signal).
4 – ETCS Written Order 04

ETCS Written Order 04

REVOCATION OF ETCS WRITTEN ORDER 03

<table>
<thead>
<tr>
<th>Signal box: .........................</th>
<th>Date: ........../....../.......</th>
<th>Time: ....... : .......</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(dd / mm / yy)</td>
<td>(hh : mm)</td>
</tr>
</tbody>
</table>

Train Running Number: ................

at: ..................................... on track: ............

(km / signal)

1 ☐ ETCS written order 03 with Authorisation Number ........................................... is revoked

2 ☐ additional instructions: ..........................................................................................................  
   .................................................................................................................................
   .................................................................................................................................
   .................................................................................................................................

Authorisation Number: ..........................

Mark with a cross the boxes of the sections that shall become valid ( □ ).

In the valid sections fill in the information on the dotted lines.

Delete non-valid text in brackets (example: km / signal).
5 – ETCS Written Order 05

**ETCS Written Order 05**

**OBLIGATION TO RUN UNDER RESTRICTIONS**

<table>
<thead>
<tr>
<th>Signal box: .......................</th>
<th>Date: ......../....../.......</th>
<th>Time: ....... : ........</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(dd / mm / yy)</td>
<td>(hh : mm)</td>
</tr>
</tbody>
</table>

**Train Running Number or Shunting Movement Number: .....................**

at: ........................................ on track: ........

(km / signal)

1 □ run on sight from: .................. to: ..................

(km / signal) (km / signal)

2 □ run with maximum speed of:

............. km/h from: .................. to: ..................

(km / signal) (km / signal)

and ............. km/h from: .................. to: ..................

(km / signal) (km / signal)

and ............. km/h from: .................. to: ..................

(km / signal) (km / signal)

3 □ examine the line, for the following reason: ........................................

........................................................................................................

4 □ report findings to: ..............................................................

........................................................................................................

5 □ additional instructions: ..........................................................

........................................................................................................

........................................................................................................

........................................................................................................

........................................................................................................

........................................................................................................

Authorisation Number: .....................

Mark with a cross the boxes of the sections that shall become valid (X).

In the valid sections fill in the information on the dotted lines. Delete non-valid text in brackets (example: km / signal).
6 – ETCS Written Order 06

Intentionally blank.
ETCS Written Order 07

PERMISSION TO START IN SR AFTER PREPARING A MOVEMENT

Signal box: .........................  Date: ......../....../........  Time: ........ : ........
(dd / mm / yy) (hh : mm)

Train Running Number: ..................

at: ................................. on track: ........
(km / signal)

1 □ is allowed to start in SR after preparing a movement

2 □ is allowed to pass EOA at: .................................
(km / signal)

3 □ run with maximum speed of:

............... km/h from: ................................. to: .................................
(km / signal) (km / signal)

and ............ km/h from: ................................. to: .................................
(km / signal) (km / signal)

and ............ km/h from: ................................. to: .................................
(km / signal) (km / signal)

4 □ is exempted from running on sight

5 □ additional instructions: .................................................................
.................................................................
.................................................................
.................................................................

Authorisation Number: .........................

Mark with a cross the boxes of the sections that shall become valid (X).
In the valid sections fill in the information on the dotted lines.
Delete non-valid text in brackets (example: km / signal).
###ANNEX B – LIST OF ETCS OPERATIONAL TRAIN CATEGORIES

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

<table>
<thead>
<tr>
<th>category</th>
<th>type of train</th>
<th>type of brake</th>
<th>cant deficiency</th>
</tr>
</thead>
<tbody>
<tr>
<td>A1</td>
<td>passenger train</td>
<td>P</td>
<td>80</td>
</tr>
<tr>
<td>A2</td>
<td></td>
<td></td>
<td>130</td>
</tr>
<tr>
<td>A3</td>
<td></td>
<td></td>
<td>150</td>
</tr>
<tr>
<td>B1</td>
<td>tilting passenger train</td>
<td></td>
<td>165</td>
</tr>
<tr>
<td>B2</td>
<td></td>
<td></td>
<td>180</td>
</tr>
<tr>
<td>B3</td>
<td></td>
<td></td>
<td>225</td>
</tr>
<tr>
<td>B4</td>
<td></td>
<td></td>
<td>245</td>
</tr>
<tr>
<td>B5</td>
<td></td>
<td></td>
<td>275</td>
</tr>
<tr>
<td>B6</td>
<td></td>
<td></td>
<td>300</td>
</tr>
<tr>
<td>C1</td>
<td>freight train</td>
<td>G</td>
<td>80</td>
</tr>
<tr>
<td>C2</td>
<td></td>
<td></td>
<td>100</td>
</tr>
<tr>
<td>C3</td>
<td></td>
<td></td>
<td>130</td>
</tr>
<tr>
<td>C4</td>
<td></td>
<td></td>
<td>150</td>
</tr>
<tr>
<td>D1</td>
<td></td>
<td></td>
<td>80</td>
</tr>
<tr>
<td>D2</td>
<td></td>
<td></td>
<td>100</td>
</tr>
<tr>
<td>D3</td>
<td></td>
<td></td>
<td>130</td>
</tr>
<tr>
<td>D4</td>
<td></td>
<td></td>
<td>150</td>
</tr>
</tbody>
</table>
9. ANNEX C – TABLE OF LINKED NON-HARMONISED RULES

The non-harmonised rules which are linked to the ERTMS operational rules and mentioned in this document are the following:

<table>
<thead>
<tr>
<th>Reference</th>
<th>Subject</th>
</tr>
</thead>
<tbody>
<tr>
<td>5.1.1</td>
<td>Cab signalling</td>
</tr>
<tr>
<td>5.1.5</td>
<td>No authorisation for ERTMS train movement at the expected time</td>
</tr>
<tr>
<td>6.2.4</td>
<td>Passing several consecutive ETCS stop markers in SR with only one written order</td>
</tr>
<tr>
<td>6.13</td>
<td></td>
</tr>
<tr>
<td>6.35</td>
<td></td>
</tr>
<tr>
<td>6.2.4</td>
<td>Checking route conditions</td>
</tr>
<tr>
<td>6.35</td>
<td></td>
</tr>
<tr>
<td>6.37.2</td>
<td></td>
</tr>
<tr>
<td>6.2.4</td>
<td>Checking necessary restrictions and / or instructions for running in SR</td>
</tr>
<tr>
<td>6.35</td>
<td></td>
</tr>
<tr>
<td>6.37.2</td>
<td></td>
</tr>
<tr>
<td>6.2.4</td>
<td>Checking speed restrictions lower than the maximum speed for SR</td>
</tr>
<tr>
<td>6.35</td>
<td></td>
</tr>
<tr>
<td>6.37.2</td>
<td></td>
</tr>
<tr>
<td>6.2.4</td>
<td>Exempting the driver from running on sight in SR</td>
</tr>
<tr>
<td>6.35</td>
<td></td>
</tr>
<tr>
<td>6.37.2</td>
<td></td>
</tr>
<tr>
<td>6.3.1</td>
<td>Manual entry into SH</td>
</tr>
<tr>
<td>6.3.3</td>
<td>Running in SH</td>
</tr>
<tr>
<td>6.3.6</td>
<td>SH refused by the RBC</td>
</tr>
<tr>
<td>6.3.7</td>
<td>Passing a defined border of a shunting area</td>
</tr>
<tr>
<td>Reference</td>
<td>Subject</td>
</tr>
<tr>
<td>-----------</td>
<td>---------</td>
</tr>
<tr>
<td>6.6</td>
<td>Train service conditions to be fulfilled</td>
</tr>
<tr>
<td>6.7.1</td>
<td>Announcement of a level 0 transition</td>
</tr>
<tr>
<td>6.7.3</td>
<td>Running in level 0</td>
</tr>
<tr>
<td>6.10.1</td>
<td>Announcement of a level STM transition</td>
</tr>
<tr>
<td>6.10.3</td>
<td>Running in level STM</td>
</tr>
<tr>
<td>6.15</td>
<td>Acknowledgement of UN</td>
</tr>
<tr>
<td>6.15</td>
<td>Running in UN</td>
</tr>
<tr>
<td>6.16</td>
<td>Acknowledgement of SN</td>
</tr>
<tr>
<td>6.16</td>
<td>Running in SN</td>
</tr>
<tr>
<td>6.26</td>
<td>Changing the adhesion factor by the driver</td>
</tr>
<tr>
<td>6.27</td>
<td>Passing a radio hole</td>
</tr>
<tr>
<td>6.28</td>
<td>Entering an occupied track section within a station</td>
</tr>
<tr>
<td>6.30</td>
<td>Revoking an authorisation for ERTMS train movement</td>
</tr>
<tr>
<td>6.31.1</td>
<td>Protecting trains in the event of an emergency situation</td>
</tr>
<tr>
<td>6.31.2</td>
<td>Restarting the trains after an emergency situation</td>
</tr>
<tr>
<td>6.31.3</td>
<td>Protecting and restarting shunting movements</td>
</tr>
<tr>
<td>6.32.2</td>
<td>Running in RV</td>
</tr>
<tr>
<td>6.33</td>
<td>Securing trains / shunting movements in case of unintentional movements</td>
</tr>
<tr>
<td>6.34</td>
<td>Managing route unsuitability</td>
</tr>
<tr>
<td>6.36.1</td>
<td>An acknowledgement for SH is requested after selecting “start”</td>
</tr>
<tr>
<td>6.36.2</td>
<td>The train is rejected when preparing a movement</td>
</tr>
<tr>
<td>6.37.1</td>
<td>Moving the train backwards after a trip</td>
</tr>
<tr>
<td>6.37.2</td>
<td>To continue running after a trip</td>
</tr>
<tr>
<td>6.37.4</td>
<td>Trip in SH</td>
</tr>
<tr>
<td>6.38</td>
<td>Managing incompatibility between trackside and ETCS on-board</td>
</tr>
<tr>
<td>Reference</td>
<td>Subject</td>
</tr>
<tr>
<td>-----------</td>
<td>---------</td>
</tr>
<tr>
<td>6.39</td>
<td>Managing a balise read error</td>
</tr>
<tr>
<td>6.40.1</td>
<td>Incoming ETCS level not available on-board when passing a transition point</td>
</tr>
<tr>
<td>6.40.3</td>
<td></td>
</tr>
<tr>
<td>6.42 a)</td>
<td>Managing a radio communication failure when SH is requested</td>
</tr>
<tr>
<td>6.43</td>
<td>Managing a failure of Self Test</td>
</tr>
<tr>
<td>6.44.1</td>
<td>Managing a failure affecting the on-board radio equipment during the preparation of the traction unit</td>
</tr>
<tr>
<td>6.44.2</td>
<td>Managing a failure affecting the on-board radio equipment while running</td>
</tr>
<tr>
<td>6.45</td>
<td>Managing a DMI with blank screen</td>
</tr>
<tr>
<td>6.46</td>
<td>Managing a system failure</td>
</tr>
<tr>
<td>7.5</td>
<td>Taking measures in case of an emergency call</td>
</tr>
<tr>
<td>7.6</td>
<td>Managing a failure during the self test of the GSM-R on-board</td>
</tr>
<tr>
<td>7.7</td>
<td>Managing a lack of GSM-R network</td>
</tr>
<tr>
<td>7.8</td>
<td>Managing a failure of the GSM-R on-board while running</td>
</tr>
<tr>
<td>7.9</td>
<td>Managing a failure of de-registration</td>
</tr>
<tr>
<td>7.10</td>
<td>Taking measures in case the functional number is not available</td>
</tr>
<tr>
<td>7.11</td>
<td>Taking measures in case the functional number is already used</td>
</tr>
<tr>
<td>7.12</td>
<td>Managing a failure while entering the functional number</td>
</tr>
</tbody>
</table>