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# INTRODUCTION

## 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 level 1 it applies to both applications, with or without trackside signals, unless otherwise stated.

#### When this document refers to level 2 it applies to both applications, with or without trackside signals, unless otherwise stated.

#### 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 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.SCOPE AND FIELD OF APPLICATION

#### The document is fully applicable to ETCS Onboard units complying with Set of specifications #2 or Set of specifications #3 of Commission Regulation 2016/919. It is also largely applicable to ETCS Onboard units complying with Set of specifications #1 of Commission Regulation 2016/919, provided that the DMI used fulfills the specification ERA\_ERTMS\_015560.

#### 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 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 3 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 / 3.

#### When ETCS level 1 or ETCS level 2 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 2.

#### 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; 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.

# REFERENCES, TERMS AND ABBREVIATIONS

## REFERENCE DOCUMENTS

| Table 1 : reference documents | | | |
| --- | --- | --- | --- |
| **Ref. N°** | **Document Reference** | **Title** |
| [1] | Annex A of the CCS TSI | Commission Regulation (EU) 2016/919 |
| [2] | EN 16494/2015 | Railway applications – Requirements for ERTMS trackside boards |

## 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: 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: a trackside signal at proceed aspect or,an MA or,a European Instruction:to start in SR after preparing a train 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. |
| 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 defined in [2] used to identify the end of a block section as a potential EOA. |
| ETCS on-board | The part of ETCS installed on a railway vehicle. |
| ETCS stop marker | Harmonised trackside ETCS signal defined in [2] used to: identify the end of a block section as a potential EOA and,indicate the location where a train running without a 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. |
| 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 signaller – 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. |
| GSM-Rnetwork | Radio network which provides GSM-R functions. |
| GSM-Rnetwork 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. |
| 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. |
| 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. |
| 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. |
| 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 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** |
| DMI | Driver Machine Interface |
| EOA | End Of Authority |
| ERTMS | European Rail Traffic Management System |
| ETCS | European Train Control System |
| FS | Full Supervision |
| G | Goods train braking mode |
| GSM-R | Global System for Mobile communication - Railway |
| LS | Limited Supervision |
| MA | Movement Authority |
| NL | Non Leading |
| NTC | National Train Control system |
| OS | On Sight |
| P | Passenger train braking mode |
| RBC | Radio Block Centre |
| RV | Reversing |
| SH | Shunting |
| SN | National System |
| SR | Staff Responsible |
| STM | Specific Transmission Module |
| UN | Unfitted |
| VBC | Virtual Balise Cover |

# PRINCIPLES

## PRINCIPLES FOR ETCS

### CAB-SIGNALLING

#### 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 listed in annex C) could require him to take into account trackside information.

### 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.

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### 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 level 1 / 2 with trackside signals.

### 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.

### AUTHORISATION TO PASS AN EOA

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

### TRAINS / SHUNTING MOVEMENTS BEING TRIPPED

#### After a trip has occurred, the driver shall continue running in the same direction only if he has received permission by operational instruction from the signaller.

### ETCS STOP MARKER

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

#### indicating the EOA of the current MA, or

#### when running without an MA unless he has received a special authorisation by the signaller.

### 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 a MA if he has received a special order by the signaller.

## PRINCIPLES FOR GSM-R

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# ETCS RULES

## PUTTING THE ETCS ON-BOARD INTO SERVICE

#### The driver switches the ETCS on-board on.

#### Levels 0, 1, 2, 3, NTC

### 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 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.

### Manual change of data

## Under conditions defined by non-harmonised rules, the driver shall enter/modify and validate the driver identification, the train running number, the level, the radio network identification and the RBC identification / phone number.PREPARING A MOVEMENT

#### The ETCS on-board is in service.

#### Levels 0, 1, 2, 3, NTC

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

### 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, the driver shall apply section 6.2.4.

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

### The traction unit has to move in SH

#### The driver shall prepare for shunting and apply rule “performing shunting movements in SH”.

### 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”.

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

#### Levels 1 without trackside signals, 2 without trackside signals, 3

#### 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 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 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 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.

#### 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.

#### Levels 1 with trackside signals, 2 with trackside signals

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



#### The driver shall apply rule 6.14 “Running in SR”

## PERFORMING SHUNTING MOVEMENTS IN SH

#### Rolling stock has to be moved in SH.

#### Levels 1, 2, 3

### Manual entry into SH

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

### 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.

### Running in SH

#### When the following symbol is displayed:



#### the driver shall apply non-harmonised rules.

### 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.

### 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.

### SH not granted

#### Levels 2, 3

#### 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.

### 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.

## ENTERING TRAIN DATA

#### Train Data have to be entered or modified.

#### Levels 0, 1, 2, 3, NTC

### Entering train data during train preparation

#### The driver / train preparer shall enter / modify and validate all of the following 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,

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

#### 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 consist match.

### 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 data, the train preparer / driver shall:

#### determine the new data,

#### enter the data,

#### validate the new data.

### 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 data if requested by the on-board system,

#### 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.

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## ENTERING AND OPERATING IN LEVEL 0

### Announcement

#### The train is approaching a level 0 area.

#### Levels 1, 2, 3, NTC

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



#### the driver shall apply non-harmonised rules.

### Acknowledgement

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



#### the driver shall acknowledge.

### Running

#### The train is running in a level 0 area.

#### When the following symbol is displayed:



#### the driver shall apply non-harmonised rules.

## ENTERING AND OPERATING IN LEVEL 1

### Announcement

#### The train is approaching a level 1 area.

#### Levels 0, 2, 3, NTC

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



#### the driver shall prepare to apply rules for level 1.

### Acknowledgement

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



#### the driver shall acknowledge.

### 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.

## ENTERING AND OPERATING IN LEVEL 2

### 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.

### Acknowledgement

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



#### the driver shall acknowledge.

### 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.

## ENTERING AND OPERATING IN LEVEL 3

### Announcement

#### The train is approaching a level 3 area.

#### Levels 0, 1, 2, NTC

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



#### the driver shall prepare to apply rules for level 3.

### Acknowledgement

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



#### the driver shall acknowledge.

### Running

#### The train is running in a level 3 area.

#### When the following symbol is displayed:



#### the driver shall apply rules according to level 3.

## ENTERING AND OPERATING IN LEVEL NTC

### Announcement

#### The train is approaching a level NTC area.

#### Levels 0, 1, 2, 3

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

#### 



#### the driver shall apply non-harmonised rules.

### Acknowledgement

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



#### the driver shall acknowledge.

### Running

#### The train is running in a 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.*

## RUNNING IN FS

#### Levels 1, 2, 3

#### When the following symbol is displayed:



#### the driver shall:

#### not exceed the permitted speed,

#### stop on the approach to an ETCS stop marker /ETCS location Marker indicating the EOA of the current MA, if running under release speed.

#### 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.

## RUNNING IN OS

#### Levels 1, 2, 3

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



#### the driver shall:

#### acknowledge,

#### start or continue running on sight.

#### When the following symbol is displayed:



#### the driver shall:

#### run on sight as long as this symbol is displayed,

#### not exceed the permitted speed,

#### stop on the approach to an ETCS stop marker / ETCS location marker indicating the EOA of the current MA, if running under release 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.

## RUNNING IN SR

#### Levels 1, 2, 3

#### 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 level 1 without trackside signals, in level 2 without trackside signals, and in level 3, 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 operational instruction.

## RUNNING IN LS

#### Levels 1, 2

#### 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.

## 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.

## 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.

## APPROACHING AN EOA WITH A RELEASE SPEED INDICATION

#### Levels 1, 2, 3

#### 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 / 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 level 1 with trackside signals to proceed without exceeding the release speed when the trackside signal shows a proceed aspect.

## 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

#### 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 / ETCS location marker is free.

## PASSING A SECTION WITH LOWERED PANTOGRAPH(S)

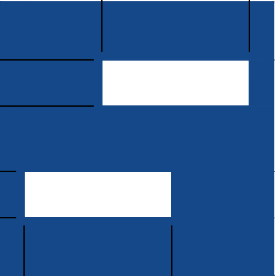
#### The train is approaching a section of the line to be passed with lowered pantograph(s).

#### Levels 1, 2, 3

#### When the following symbol is displayed:



#### and/or the following marker board is encountered



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

#### When the following symbol is displayed:



#### and/or the following marker board is encountered



#### the driver shall keep the pantograph(s) lowered.

#### When the following symbol is displayed:



#### and/or the following marker board is encountered



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

## 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

#### When one of the following symbols is displayed:



#### the driver shall change the electric power supply accordingly.

## 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, 3

#### When the following symbol is displayed:



#### and/or the following marker board is encountered

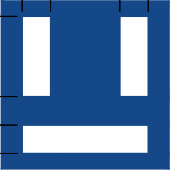


#### the driver shall switch off the main power switch, taking into account the position of the pantographs.

#### When the following symbol is displayed:



#### and/or the following marker board is encountered

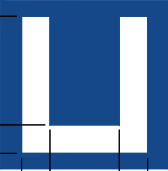


#### the driver shall keep the main power switch switched off.

#### When the following symbol is displayed:



#### and/or 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.

## PASSING A NON STOPPING AREA

#### The train is approaching a non stopping area.

#### Levels 1, 2, 3

#### When the following symbol is displayed:



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

#### When the following symbol is displayed:



#### the driver shall avoid stopping.

## 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, 3

#### When the following symbol is displayed:



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

#### When the following symbol is displayed:



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

## 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

#### 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.

## 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

#### 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.

## 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

#### 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.

## SOUNDING THE AUDIBLE WARNING DEVICE

#### Levels 1, 2, 3

#### When the following symbol is displayed:



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

## CHANGING OF ADHESION FACTOR

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

#### Levels 1, 2, 3

#### When the following symbol is displayed:



#### the driver shall apply non-harmonised rules.

## PASSING A RADIO HOLE

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

#### Levels 2, 3

#### 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 “authorising the passing of an EOA”.

## 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, 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.

## PERFORMING A TANDEM MOVEMENT

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

#### Levels 0, 1, 2, 3, NTC

### Entry into NL

#### The driver of the non leading engine shall select “Non-Leading”.

#### When the following symbol is displayed on the DMI:



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

#### When the following text message is displayed on the DMI of the non leading engine:

#### “No track condition will be received”

#### the driver of the non leading engine shall inform the driver of the leading engine. Both drivers shall apply non-harmonised rules.

### Performing the tandem movement

#### The tandem movement shall be performed according to non-harmonised rules.

### Exit from NL

#### When the train is at a standstill the driver of the non leading engine shall:

#### apply the brakes,

#### confirm to the driver of the leading engine that the non leading traction unit is not any more in NL.

## REVOKING AN AUTHORISATION FOR ERTMS TRAIN MOVEMENT

#### The signaller decides to change existing traffic arrangements.

#### Levels 1, 2, 3

#### If possible in level 2 and in level 3 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 European Instruction 3.

#### 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.

## TAKING MEASURES IN THE EVENT OF AN EMERGENCY

#### An emergency situation occurs.

#### Levels 1, 2, 3

### 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.

#### To stop trains in level 2 and in level 3, 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.

#### When the following text message is displayed:

#### “Emergency stop”

#### and the train is tripped, the driver shall apply rule “responding to a trip”.

### 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 European Instruction 5. 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 European Instruction 2.

### To protect and restart shunting movements

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

## STOPPING IN A SAFE AREA

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

#### Levels 1, 2, 3

#### 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:



#### and the driver decides to stop at the indicated safe area he shall take into account the remaining distance displayed on the DMI.

#### When the following symbol is displayed:



#### and the driver decides to stop at the indicated safe area, he shall stop the train.

## PROPELLING IN RV

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

#### Levels 1, 2, 3

### 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.

### 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 as soon as the following symbol is displayed:



#### not exceed the maximum speed for RV,

#### not exceed the permitted distance to run.

### 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.

### 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.

## 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, 3

#### 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.

## MANAGING ROUTE UNSUITABILITY

#### Levels 1, 2, 3

#### 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 and signaller shall apply non-harmonised rules.

## AUTHORISING THE PASSING OF AN EOA

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

#### Levels 1, 2, 3

#### 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 is free then he can 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.

#### To pass the EOA, the driver shall:

#### receive European Instruction 1 from the signaller,

#### check the applicable speed limit,

#### use the override function,

#### and when the following symbol is displayed:



#### start the train,

#### not exceed the override EOA speed while this symbol is displayed.

## REACTING TO UNEXPECTED SITUATIONS WHEN PREPARING A TRAIN MOVEMENT

#### Levels 2, 3

### 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.

### 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.

## RESPONDING TO A TRIP

#### A train or a shunting movement is tripped.

#### Levels 1, 2, 3

### 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.

#### ***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.

### To continue running

#### 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 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 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 level 2 and in level 3, 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, European Instruction 1 shall be issued by the signaller in place of European Instruction 2.

### 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.

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

#### Levels 1, 2, 3

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

## MANAGING A TRACKSIDE MALFUNCTION

#### The on-board receives the information of a trackside equipment malfunction.

#### Levels 1, 2, 3

#### When the following text message is displayed:

#### “Trackside malfunction”,

#### the driver shall inform the signaller about the situation.

## MANAGING INCOMPATIBILITY BETWEEN TRACKSIDE AND ETCS ON-BOARD

#### An incompatibility between trackside and ETCS on-board occurs and the train is tripped.

#### Levels 1, 2, 3

#### 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.

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

## MANAGING A LEVEL CROSSING NOT PROTECTED

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

#### Levels 1, 2, 3

### If in FS, OS or LS

#### When the following symbol is displayed:



#### the driver shall proceed as instructed by the DMI and apply Rule 7 of Appendix B.

### If in SR

#### When the following text message is displayed:

#### “Level crossing not protected”,

#### the driver shall ~~assume that the level crossing is not protected and~~ apply Rule 7 of Appendix B.

## 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

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

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

## 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

### The level transition point is marked through the following trackside marker board:



### 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 “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.

### If in SR

#### The driver shall:

#### stop the train,

#### apply the following section 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 “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.

## 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, 3

#### 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”).

## MANAGING A RADIO COMMUNICATION FAILURE

|  |
| --- |
| An ETCS radio communication failure occurs.Levels 0, 1, 2, 3, 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 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) when in level 2 preparing a tandem movement***

#### The driver of the non leading engine shall inform the driver of the leading engine about the radio communication failure. Both drivers shall apply non-harmonised rules.

#### ***c) in all other cases***

#### The signaller shall authorise the driver to pass the EOA (rule ”authorising the passing of an EOA”).

## MANAGING A FAILURE OF SELF TEST

#### Levels 0, 1, 2, 3, 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 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.

## MANAGING A FAILURE AFFECTING THE ON-BOARD RADIO EQUIPMENT

#### Levels 0, 1, 2, 3, NTC

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

### During the preparation of the traction unit

#### Levels 2, 3

#### 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 need not be moved, the driver shall switch off the ETCS on-board.

### While running

#### Levels 1 with infill function by radio, 2, 3

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

## MANAGING A DMI WITH BLANK SCREEN

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

#### Levels 0, 1, 2, 3, NTC

#### 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.

## MANAGING A SYSTEM FAILURE

#### Levels 0, 1, 2, 3, NTC

#### When the following symbol is displayed:



#### the driver shall inform the signaller about the situation.

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

## MANAGING A NTC FAILURE

#### Levels 0, 1, 2, 3, NTC

#### When the following text message is displayed:

#### “[name of NTC] failed”

#### the driver shall acknowledge and apply non-harmonised rules.

## MANAGING A VBC

#### Levels 0, 1, 2, 3, NTC

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

# GSM/R RULES

## 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.

## 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.

## SELECTING THE GSM-R NETWORK AT A BORDER CROSSING

#### The train is approaching a border crossing.

### Inhibition of automatic network selection

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

### Selection of another GSM-R network

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

## PERFORMING A DE-REGISTRATION

#### The train has to be manually de-registered.

#### The driver shall carry out the de-registration according to non-harmonised rules.

## INTENTIONALLY BLANK

## 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 rule 8 of Appendix B.

## 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 rule 8.2 of Appendix B.

## INTENTIONALLY BLANK

## MANAGING A FAILURE OF DE-REGISTRATION

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

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

## 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 signaller about the situation.

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

## 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 signaler on the issue.

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

## 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.

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

## GSM-Public as primary communication (if this option is available onboard)

### 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.

### 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.

## GSM-Public as fall-back communication (if this option is available onboard)

### 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 onboard GSM-R terminal is configured to carry out an automatic network selection.

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

### 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 onboard GSM-R terminal is configured to carry out an automatic network selection.

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# 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** | **80** |
| **FP 2** | **100** |
| **FP 3** | **130** |
| **FP 4** | **150** |
| **FG 1** | **G** | **80** |
| **FG 2** | **100** |
| **FG 3** | **130** |
| **FG 4** | **150** |

# 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:

| **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 a level 0 transition | IM |
| 6.7.3 | Running in level 0 | IM |
| 6.11.1 | Announcement of a level NTC transition | IM |
| 6.11.3 | Running in 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 | 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 |
| 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 |