



X2Rail-5

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Deliverable D4.1 Moving Block Specification Part 4 – Operational Rules

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Table of Contents

TABLE OF CONTENTS.....	3
1 BACKGROUND.....	4
2 OPERATIONAL RULES	5
2.1 Generic Operational Rules.....	6
2.2 Trackside Initialisation.....	11
2.3 Start of Mission.....	14
2.4 Level Transitions	17
2.5 On Sight	18
2.6 Shunting	19
2.7 Non-Communicating Trains.....	21
2.8 Loss of train integrity.....	23
2.9 Recovery	24

1 Background

This document is Part 4 of Deliverable D4.1 “Moving Block Specifications” from the Project titled “Completion of activities for Adaptable Communication, Moving Block, Fail Safe Train Localisation (including satellite), Zero on site Testing, Formal Methods and Cyber Security” (Project Acronym: X2Rail-5; Grant Agreement No 101014250).

Deliverable D4.1 is made up of several different parts. This is Part 4 – Operational Rules. See Part 1 – Introduction for a list of the different Parts of this Deliverable.

All terms and abbreviations, and all references for all parts of D4.1 are located in Part 1 – Introduction.

2 Operational Rules

This Part of D4.1 provides Operational Rules for an ETCS Level 3 system, where they are in addition to the existing Operation and Traffic Management TSI [OPE TSI]. Operational Rules are included where the system requirements in Part 3 require operator interaction.

There are no Operational Rules included where Part 3 states that there is project-specific design. Further Operational Rules may be required, depending on the project-specific design.

The section is structured into sub-sections, based on the Operational Scenarios which were used by the Working Group in X2Rail-1 as a development tool for the Rules and Requirements. These Operational Scenarios are listed in the Methodology section in Part 1.

Each rule has been structured in four different parts:

- ID: each item is given a Unique ID, structured as follows:

<Type>-<Section>-<Number>

where:

<Type> is “OPE” for D4.1 Part 4 – Operational Rules

<Section> is an abbreviation within the document for a section of rules

<Number> is a number unique to the rule within a <Section>

- Rule: This is the text of the Rule
- Rationale: This is the reasoning explaining why and in which situations this Rule is needed
- Guidance: This is a proposal for the Rule implementation or other aspects to be considered during its implementation.

Several new or revised Operational Rules have been identified which apply to multiple scenarios concerning the operation of trains in Level 3. These generic rules are listed at the start of this section.

The Operation and Traffic Management TSI [OPE TSI] allows each application to decide on how the Dispatcher and Driver will manage scenarios where there is no interoperability or safety requirement for them to be managed in a harmonised manner. Scenarios in this document where it is the responsibility of the Infrastructure Manager to define the operational rules to be applied, if any, are identified using the phrase “in accordance with non-harmonised rules”.

2.1 Generic Operational Rules

This section provides ‘generic’ rules for an ETCS Level 3 system, where they are in addition to the existing Operation and Traffic Management TSI [OPE TSI]. Generic rules are valid across multiple scenarios.

OPE-Generic-1

[X2R3 D4.2: OPE-OS-2]

When the Dispatcher has asked the Driver to confirm that adjacent sections of track are Clear, the Driver shall, in accordance with non-harmonised rules, observe the sections of track and confirm to the Dispatcher the status of these sections of track.

Rationale:

The Driver of a train passing along a path though the track may be able to give feedback to the Dispatcher, to enable adjacent sections of track to be cleared.

Guidance:

The prime purpose of a sweeping movement is to confirm the track in the path travelled by the train is Clear and reset the trackside record.

Sweeping can also be used to reset TTD equipment.

The Driver can also observe adjacent sections of track, for example at junctions, or along parallel tracks. Where the Infrastructure Manager allows the Driver to confirm that adjacent sections of track are Clear, then consideration should be given to the visibility in each direction of travel (driving cab design) and poor visibility/darkness.

Requirements: REQ-TTD-11

OPE-Generic-2

[X2R3 D4.2: OPE-Generic-1]

When advised by the Driver that an adjacent section of track has been examined and observed clear, the Dispatcher shall, in accordance with non-harmonised rules, remove or reduce Unknown Track Status Areas.

Rationale:

The Driver of a train passing along a path though the track may be able to give feedback to the Dispatcher, to enable adjacent sections of track to be cleared.

Guidance:

The Dispatcher may need staff and/or Driver’s assistance to make sure that no parts of a train have been left behind before clearing the area, e.g. after using an Unknown Track Status Area to move a non-communicating train.

Where the Dispatcher has created a “Non-Sweepable” Unknown Track Status Area to require all Drivers to proceed On Sight due to a hazard adjacent to the line, then this Operational Rule would allow it to be removed.

It is project specific how the removal of this area of Unknown may affect an authorisation already sent to a train covering that area (for example, resending the MA without an OS mode profile). Track Status Areas may overlap; therefore, this information should be made available to the Dispatcher according to project specific decisions.

Requirements: REQ-TrackStatus-24, REQ-TTD-11

OPE-Generic-3

[X2R3 D4.2: OPE-Generic-2]

The Driver shall only confirm train integrity in accordance with non-harmonised Operational Rules.

Rationale:

Rules are needed to define conditions and responsibilities for the Driver to confirm train integrity in a safe way.

Guidance:

The risks of a Driver erroneously confirming integrity on the DMI should be considered before allowing the Driver to undertake this action. The Driver could confirm integrity themselves, with a shunter, a member of platform staff, or by means of a technical solution such as a back-up system. In Level 3 the system relies on position reports from the train to establish the track status. The Dispatcher might authorise a train without integrity confirmed to proceed and request that the Driver stops at a platform or other operationally convenient location in order to confirm train integrity.

The rule may be that the Driver is forbidden to confirm train integrity. In this case, the L3 Trackside can be engineered not to use confirmation of train integrity received from the Driver.

The Operational Rules may also include verbal confirmation of train integrity from Driver to Dispatcher, without using the DMI.

Requirements: REQ-TrainLoc-9

OPE-Generic-4

[X2R3 D4.2: OPE-Generic-3]

When asked by the Dispatcher to report the location of the train, the Driver shall do so in accordance with non-harmonised rules.

Rationale:

Drivers may need to report the location of the train in various situations, e.g. if starting with an unknown position, or detecting obstacles in the track.

Guidance:

For reporting the location of the train, drivers may use unique trackside references as well as geographical position information, if available. The provision of geographical position information on the DMI requires the L3 Trackside to transmit the relevant information. In some locations this may not be possible, and the Driver will need to refer to trackside features.

Requirements: REQ-SoM-4

OPE-Generic-5**[X2R3 D4.2: OPE-Generic-4]**

Where required, the Driver shall, in accordance with non-harmonized rules, and in line with [SS091], follow a safe process for determining and entering or validating the train length on the DMI.

Rationale:

Whilst train length is safety critical in all ETCS Levels, it is more critical in Level 3. This is because the train length information is used to release the railway behind a train when a new train position report with integrity confirmed is received. If the train length entered is shorter than the real train length, this increases the risk of collision, as a following train might be issued a Movement Authority based on the reported train length. If the train length entered is longer than the real train length, when the train moves, the train may incorrectly clear areas of track at its starting location which are in fact still occupied.

Guidance:

The train length needs to be entered or validated whenever Train Data is entered during Start of Mission or when the length changes as a result of splitting or joining, during rescue movements, etc.

The entry of train length can be automated for fixed train sets, or trains which are a combination of fixed train sets. This reduces the risk of human error when entering train length.

For variable consist trains, it may still be necessary for the Driver to manually enter the train length. The Driver must have a clear process for establishing the length of the train (this may require a physical check or information supplied by other means).

For both fixed and variable consists, the train length provided should represent the actual length of the train. It is not necessary to add a margin. It is not necessary for the Driver to add a margin. A margin will be added by the L3 Trackside. For a train which varies in length because of the opening and closing of the gaps between railway vehicles, the train length at maximum extension is assumed to be used.

Requirements: None

OPE-Generic-6**[X2R3 D4.2: OPE-Generic-5]**

Drivers shall not move trains in SB or NP mode unless in accordance with non-harmonised rules.

Rationale:

Train movements in SB or NP mode must have protection provided within the L3 Trackside, for example via an Unknown Track Status area created by the Dispatcher.

Guidance:

Movements in SB or NP mode should not normally be allowed unless there is a good operational reason, such as splitting or joining, or to move a train clear of a balise or big metal mass in order to perform Start of Mission.

A single movement in SB mode (limited by D_NVROLL) will normally be allowed for within the Unknown Track Status Area established at End of Mission. Repeated movements could lead to the train moving outside the protected, Unknown Area.

Requirements: None

OPE-Generic-7**[X2R3 D4.2: OPE-Generic-6]**

The Dispatcher shall, in accordance with non-harmonised rules, create, reduce or extend an Unknown Track Status Area flagged as “Sweepable” or “Non-Sweepable”.

Rationale:

In certain circumstances the L3 Trackside may not be able to automatically create an Unknown Track Status Area, for example in presence of an unexpected obstruction, and therefore input from the Dispatcher is required.

Guidance:

The non-harmonised rules need to describe how the Dispatcher establishes a protected area (using an Unknown Track Status Area). Reasons for creating an Unknown Track Status Area as “Non-Sweepable” might be to protect a section of line with a reported potential hazard, e.g. land slide, a failed level crossing, or a trespass incident. In these cases, the Drivers may need to be advised and then authorised to proceed in On Sight. Unknown areas can also be established to move

non-communicating trains through the L3 area. Projects may find other reasons for using Unknown Track Status areas.

Depending on the reason for creating the Unknown Track Status Area the non-harmonised rules may require that the Unknown Track Status Area remains in place after the passage of a train and hence should be flagged as “Non-Sweepable”.

Requirements: REQ-TrackStatus-22, REQ-TrackStatus-23, REQ-TrackStatus-24

OPE-Generic-8**[X2R3 D4.2: OPE-Generic-7]**

The Dispatcher shall, in accordance with non-harmonised rules, be able to move a set of points partially or completely located in an Occupied or Unknown Area.

Rationale:

In special circumstances, a set of points that are within an area which is not clear may have to be moved, for example to allow a train without communications to be moved to a safe location on the railway.

Guidance:

For Occupied Track Status areas, this is no different to existing functionality in L2 systems.

Requirements: REQ-PTS-3

OPE-Generic-9**[X2R3 D4.2: OPE-Generic-8]**

Drivers shall not close the desk whilst the train is moving.

Rationale:

Closing the desk will result in the train performing End of Mission and closing the communication session with the L3 Trackside. A moving train not reporting to the L3 Trackside represents a hazard.

Guidance:

None.

Requirements: None

2.2 Trackside Initialisation

2.2.1 Introduction

On a Level 3 railway, Train Location determined by Train Position Reports received from the trains, which are recorded and evaluated by the L3 Trackside. When the system is initialised, the L3 Trackside considers the whole railway as having Track Status Unknown until it can establish the Train Location of all trains/vehicles, particularly those that are not communicating. This section considers the issues to be addressed by Operational Rules to support the safe and efficient initialisation of the system and resumption of normal train operations.

Note: The Responsible Person mentioned in some of the Operational Rules is identified by the Infrastructure Manager and can be the Maintenance Engineer, Testing Engineer, or the Dispatcher, depending on whether the system requires initialisation or reset.

2.2.2 Rules

OPE-TrackInit-1**[X2R3 D4.2: OPE-TrackInit-1]**

The Infrastructure Manager shall define the non-harmonised procedures for initialising or restarting of the L3 Trackside.

Rationale:

Establishing the track status of the Level 3 railway is more complicated, and the process will depend on whether or not TTD is provided. There are risks of resuming normal operation until reasonable steps have been undertaken to confirm the occupation track status of the railway. Until established otherwise, the whole railway will be treated as the Track Status being in an Unknown state.

Guidance:

The initialisation or restarting of the trackside hardware is likely to be the same as for Level 2.

In the absence of TTD, it may be appropriate for operational procedures to require the connection of all known trains and that the L3 Trackside has recorded their Train Location before the system is instructed that the remainder of the railway is Clear. Where trains are unable to connect, suitable alternative protections should be put in place, e.g. an Unknown area.

Where TTD or other systems allow the absence of trains to be proven, the arrangements for using this information to change the status from Unknown to Clear may require the confirmation from the Dispatcher or others. Sections which remain Unknown will need to be swept to become Clear, if they are Sweepable.

When the L3 Trackside restarts, Drivers and Dispatchers need to be aware of the time it may take for a train to re-establish a safe communication session, typically up to 5 minutes. Calls from Drivers could distract a Dispatcher during the initialisation process and the Infrastructure Manager could put in place an Operational Rule requiring the Dispatcher to make a voice broadcast prior to re-initialisation of the system, advising Drivers not to contact them for a specified period of time (e.g. ten minutes), except in an emergency.

Requirements: None

OPE-TrackInit-2**[X2R3 D4.2: OPE-TrackInit-2]**

Where the system permits, and in accordance with non-harmonised rules, the person in charge of the work, the Responsible Person, shall enter information about trains and obstructions in the area.

Rationale:

The L3 Trackside must be aware of all obstructions in the Area of Control.

Guidance:

The system may in some situations require input from the Responsible Person to define Unknown Track Status Areas. The creation of Unknown Track Status Areas may be used during system initialisation, to enter obstructions into the L3 Trackside, or when authorising the use of Override to manage non-communicating train movements.

The setting of areas as Unknown Track Status needs to follow a safe and robust process.

The system may also allow the Responsible Person to place reminders recording details of the trains/obstructions in addition to setting the track occupancy status. Such reminders can assist the Responsible Person with planning sweeping movements to avoid sending trains through areas known to be occupied.

Requirements: REQ-TrackStatus-22, REQ-TrackStatus-23

OPE-TrackInit-3**[X2R3 D4.2: OPE-TrackInit-4]**

Prior to the restart of a system, the Responsible Person shall if required by non-harmonised rules, instruct all Drivers, by voice radio call or other means, to stop and confirm all trains at a stand.

Rationale:

Trains running in Staff Responsible mode do not have an MA and may not be communicating their position to the L3 Trackside. Advising all Drivers of the need to stop and the reason will avoid unnecessary radio calls to the Responsible Person and support the safe, efficient recovery of the signalling system. Stored Train Location information can be used to restore the system to normal operation more efficiently. If there is the potential of trains moving, then it may not be safe to rely on the stored information.

Guidance:

Having all trains at a stand with the Drivers aware not to seek to move the train simplifies the process of restarting the system and reduces the risk of sections being declared Clear when they are not. Examples of when re-initialisation is required include: need to restart the system to load new configuration data; necessity to update the system following re-arrangement of infrastructure within a control area.

Requirements: None

OPE-TrackInit-4**[X2R3 D4.2: OPE-TrackInit-5]**

If configured, after completing initialisation of the L3 Trackside, the Responsible Person shall confirm to the L3 Trackside that the procedure is complete, in accordance with non-harmonised rules.

Rationale:

The Responsible Person for initialising the L3 Trackside may need to confirm when the procedure has concluded. They have the authority to confirm that all the obstacles on the railway are known to the L3 Trackside. Only after this has occurred the L3 Trackside can authorise trains to move.

Guidance:

For L3 Tracksides configured to use Stored Information at Trackside Initialisation, confirmation by the Responsible Person is optional.

Requirements: REQ-TrackInit-3

2.3 Start of Mission

2.3.1 Introduction

When trains undertake Start of Mission, it is not always possible to identify their location uniquely or determine that there are no other trains in front of them. One key operational difference from Level 2 is that the movement of trains which are unable to report train integrity confirmed (due to failure or absence of TIMS) needs to be managed differently, considering the operational impact of a train moving without integrity confirmed.

2.3.2 Rules

OPE-SoM-1

[X2R3 D4.2: OPE-StartTrain-1]

At Start of Mission or following a change in train length (e.g. splitting and joining), the Driver shall check that the Train Integrity Monitoring System (TIMS), where fitted, is operational.

Rationale:

This is to avoid having degraded operational performance due to a train starting a mission without integrity confirmed.

Guidance:

The Driver will need to check the status of the TIMS in accordance with procedures relevant to the fitted TIMS. Since the task of the Driver at Start of Mission includes a number of other checks, a Railway Undertaking may consider specifying that if the TIMS is not available an alarm is sounded, or a message is displayed when the desk is opened. In areas without TTD, the provision of operational TIMS eliminates the operational impact of needing to sweep behind the train.

Requirements: None

OPE-SoM-2

[X2R3 D4.2: OPE-StartTrain-2]

Non-harmonised Operational Rules shall define under which circumstances the Driver is allowed to move a train which is not able to report integrity confirmed.

Rationale:

This is to avoid a train leaving the area behind it as track status Unknown, with consequent operational impact on the railway.

Guidance:

Movement of a train without integrity confirmed is application specific. A train unable to confirm its integrity will not be able to update the L3 Trackside with the information that it has left a section of line, resulting in the line behind the train remaining with

Track Status Unknown. Declaring the section as Track Status Clear requires a sufficient level of safety integrity through the use of TTD or sweep processes. Until the line behind the train can be declared Clear, there will be operational impact.

Requirements: REQ-MA-9

OPE-SoM-3**[X2R3 D4.2: OPE-StartTrain-3]**

Non-harmonised Operational Rules shall define where, after receiving notification of a train reporting a position which cannot be determined by the L3 Trackside, the Dispatcher and Driver shall make contact to determine an approximate position for the train.

Rationale:

A train with a position which cannot be determined by the L3 Trackside is a hazard, as such its location must be determined as quickly as possible by the Dispatcher and the Driver.

Guidance:

None.

Requirements: REQ-SoM-4

OPE-SoM-4**[X2R3 D4.2: OPE-StartTrain-4]**

After determining an approximate position of a train with the Driver, non-harmonised Operational Rules shall define how the Dispatcher positions the train in the L3 Trackside.

Rationale:

This is to enable the L3 Trackside to maintain knowledge of Train Locations for all trains within the L3 Area.

Guidance:

This Operational Rule is applicable if at Start of Mission a train reports an Unknown position, or reports a position which the L3 Trackside is not able to validate. In this case, the Dispatcher can determine the train position, in consultation with the Driver, and enter the train position into the L3 Trackside.

Requirements: REQ-SoM-4; REQ-TMS-1

OPE-SoM-5**[X2R3 D4.2: OPE-StartTrain-5]**

The Dispatcher shall only authorise Override to be used for a train without a Known Location in the L3 trackside, after having assigned a location for this train.

Rationale:

At Start of Mission, use of Override should be avoided for a train with an unknown or ambiguous position because the location and movement of such a train is unknown to the L3 Trackside and may interfere with other (known) movements.

Guidance:

An ambiguous position in this context is where the L3 Trackside receives a valid position which could refer to more than one location, e.g., after a divergence.

Override can be used to move a train to read a balise group, and thereby report a Known Location.

The position of the train could possibly be resolved by the Driver reporting a lineside reference point to the Dispatcher and the Dispatcher then trying to reserve a path for the train before permitting the Driver to use Override. If it is possible for the Dispatcher to inform the L3 Trackside about the (approximate) position of the train, it might not be necessary to use Override as the L3 Trackside may be able to give SR Authorisation. The authorisation for a driver to use Override where the data communication is not available is not affected by this rule if the train has a valid position.

Override can also be used for a train with a Known Location, as in Level 2.

Requirements: None

OPE-SoM-6**[X2R3 D4.2: OPE-StartTrain-6]**

Upon receiving an alert from the TMS of a train that has not provided Validated Train Data, the Dispatcher shall follow non-harmonised rules to resolve the situation.

Rationale:

The Dispatcher may need to react if Validated Train Data is not received in timely manner, or if the communication session has been terminated before receipt of Validated Train Data.

Guidance:

A train from which Validated Train Data has not been received, and therefore not acknowledged by the L3 Trackside, will not be able to accept a Movement Authority.

The L3 Trackside can be configured with a timeout, which if it expires, will result in an alert via the TMS if Validated Train Data is not received after Start of Mission.

The Dispatcher may need to take some action, such as the creation of an Unknown Track Status Area to protect the train, or making contact with the Driver.

Requirements: REQ-SoM-7, REQ-SoM-8

2.4 Level Transitions

2.4.1 Introduction

It is undesirable for trains to enter a Level 3 area if they cannot report train integrity confirmed due to the operational penalties of needing to sweep the track behind the train. Rules need to address the scenarios where a train is detected as not being fit to enter a Level 3 area and when a train may enter a Level 3 area in a degraded situation. Transitions out of Level 3 areas are not significantly different from those out of Level 2 areas except where the train is unable to report integrity confirmed.

2.4.2 Rules

OPE-LevelTrans-1**[X2R3 D4.2: OPE-LevelTrans-1]**

Where TIMS operational status is indicated to the Driver and a fault is shown, the Driver shall not enter a Level 3 area unless permitted to do so by the Dispatcher, in accordance with non-harmonised rules.

Rationale:

The operational impact of a train operating in a Level 3 area without reporting train integrity confirmed is significant.

Guidance:

The Infrastructure Manager may conclude that, at certain locations, it is acceptable for trains to proceed into a Level 3 area with no fitted TIMS or with a faulty TIMS, or that they must be diverted, or the service terminated. The Infrastructure Manager may provide announcement signs for Level 3 areas to supplement the Driver's knowledge of the route or the announcement on the DMI may be considered sufficient.

Requirements: None

OPE-LevelTrans-2**[X2R3 D4.2: OPE-LevelTrans-2]**

When TIMS is not working or the train is not reporting train integrity confirmed and the Level 3 trackside is engineered not to authorise such trains to enter, the Dispatcher shall apply non-harmonised rules whether to authorise a train to enter a Level 3 area.

Rationale:

In those circumstances when the system will not issue an MA into a Level 3 area because a train has not reported train integrity confirmed, the Dispatcher will need to authorise the Driver to use the Override procedure. Once the train enters the Level 3 area, it will be managed in accordance with loss of train integrity Operational Rules.

Guidance:

Whilst this situation is undesirable, there may occasionally be circumstances whereby a train enters a Level 3 area without having TIMS working or installed.

Requirements: REQ-LossTI-3

2.5 On Sight

2.5.1 Introduction

Where the L3 Trackside cannot establish track occupancy status, i.e. that the track status is Clear, trains will need to enter or pass the area in On-sight mode. Rules need to state what information the Driver needs prior to the system offering On-sight mode and what checks the Dispatcher should make before authorising the movement. The use of On-sight mode for trains to enter an occupied line for the purposes of joining or to check for infrastructure defects is unchanged from Level 1/2.

2.5.2 Rules

OPE-OS-1**[X2R3 D4.2: OPE-OS-1]**

When sweeping an area in ETCS Level 3 On sight mode, the Driver shall, in accordance with non-harmonised rules, follow operational procedures.

Rationale:

In order to enter or pass in OS mode, the Driver may have to consider additional checks that are different to those for On-sight when this is used to join with another train or pass over failed infrastructure.

Guidance:

This is application specific. Normally, it is expected that the track will be Clear, but the Driver should always consider that there may be an obstruction.

Requirements: None

OPE-OS-2**[X2R3 D4.2: OPE-OS-4]**

The Dispatcher shall, in accordance with non-harmonised rules, advise the Driver of any specific checks prior to authorising a move in On sight mode.

Rationale:

There may be specific instructions for the Driver before proceeding in On-sight. It may also be a requirement that the Driver is made aware of the reason for the On-sight movement authority.

Guidance:

In some countries, drivers are expected to accept an On-sight movement authority and drive cautiously checking for vehicles or other significant obstructions without having been previously advised. Other countries require the Driver to be aware of the reason for the On-sight movement authority, via verbal communications, text messages or other means.

This could be handled by using ETCS Written Order 05 (OBLIGATION TO RUN UNDER RESTRICTIONS) [OPE TSI] which includes an optional requirement for the results to be reported back.

Requirements: REQ-MA-3, REQ-MA-7

OPE-OS-3

[X2R3 D4.2: OPE-OS-5]

Upon receipt of a request from the L3 Trackside to extend a Movement Authority in an Occupied or Unknown Track Status Area the Dispatcher shall accept or reject the request, in accordance with non-harmonised rules.

Rationale:

Depending on the L3 Trackside configuration, extension of the MA into an Occupied or Unknown Area may also require authorisation from the Dispatcher.

Guidance:

None.

Requirements: REQ-MA-7, REQ-MA-8

2.6 Shunting

2.6.1 Introduction

For the L3 Trackside to monitor the location of all trains and vehicles, it is necessary for them to be communicating. Entry into Shunting mode causes the train to disconnect and, hence, non-harmonised rules are required regarding shunting authorisation and the resumption of normal operation when shunting is complete.

2.6.2 Rules

OPE-SH-1

[X2R3 D4.2: OPE-SH-1]

The Dispatcher shall, in accordance with non-harmonised rules, activate Temporary Shunting Areas, where needed.

Rationale:

In addition to conditions which can be checked by the L3 Trackside, the Dispatcher may need to confirm to the L3 Trackside that no movement which is unknown to the L3 Trackside is in progress.

Guidance:

A Temporary Shunting Area is one configured in the L3 Trackside which, when activated, may impose interlocking controls such as preventing protecting points being moved or paths being set into the area, and enables the L3 Trackside to authorise SH when requested by an ETCS On-board.

The Dispatcher may inform the Drivers of any trains within the Temporary Shunting Area before activating the Temporary Shunting Area.

Requirements: REQ-SH-1

OPE-SH-2**[X2R3 D4.2: OPE-SH-2]**

The Dispatcher shall, in accordance with non-harmonised rules, deactivate Temporary Shunting Areas.

Rationale:

Before deactivating a Shunting Area, it should be clearly determined that all shunting activities within that area have been completed.

Guidance:

A Temporary Shunting Area is one configured in the L3 Trackside which, when activated may impose interlocking controls such as preventing protecting points being moved or paths being set into the area, and enables the L3 Trackside to authorise SH when requested by an ETCS On-board.

In addition to conditions which can be checked by the L3 Trackside when deactivating Shunting Areas, the Dispatcher:

- may need to confirm that shunting movements are terminated
- may need to ensure that the train length stored for the Temporary Shunting Area matches the length of trains within the Temporary Shunting Area.

The Dispatcher should consider where there are any adjacent Active Shunting Areas or uncontrolled areas, from which trains may have entered the Temporary Shunting Area.

Requirements: REQ-SH-1, REQ-SH-5

OPE-SH-3[X2R3 D4.2: OPE-SH-3]

The Dispatcher shall, in accordance with non-harmonised rules, allow trains to enter an Active Shunting Area.

Rationale:

Shunting activities must be protected from other trains entering the area. Trains entering the area must also be protected from shunting activities in progress. Whilst the basic principles are likely to be the same for Temporary and Permanent Shunting Areas, there may be changes in detail, depending on the technical solutions employed at each location.

Guidance:

Before allowing a train to enter an Active Shunting Area, the Dispatcher will check that the path into the area is secured for the movement. Infrastructure Managers could consider deploying TTD in regular shunting areas to reduce the Dispatcher's workload. The Dispatcher may also instruct the Driver to continue the movement until the train is completely within the Shunting Area.

Requirements: REQ-MA-3

2.7 Non-Communicating Trains

2.7.1 Introduction

For a system which relies on train reports, situations where communication is not available need to be managed, since the location of a non-communicating train will not be available. This section describes the non-harmonised rules required to allow trains into areas where there is no radio coverage due to a failure of part of the system.

2.7.2 Rules

OPE-LossComms-1[X2R3 D4.2: OPE-LossComms-1]

The Dispatcher shall, in accordance with non-harmonised rules, protect the movement of a non-communicating train.

Rationale:

Movement of a non-communicating train must be safe and controlled by the Driver and the Dispatcher working together.

Guidance:

The detail of how the movement of a non-communicating train could be protected is application specific.

The Unknown Track Status Area where the train is may be extended, and the Driver be allowed to move up to a specific location within this Unknown Track Status Area, or to where it is expected communication will be regained. It is important that a train is not allowed to move to an area that the L3 Trackside considers to be Track Status Clear.

A Reserved Status Area may also be used to protect the movement of a non-communicating train.

This Rule is also applicable at the boundary of the L3 Area of Control, if it becomes necessary to protect the movement of a non-communicating train which is required to enter the L3 Area of Control.

Requirements: REQ-TrackStatus-24, REQ-Reserved-1

OPE-LossComms-2

[X2R3 D4.2: OPE-LossComms-2]

The Dispatcher shall, in accordance with non-harmonised rules, activate a pre-defined Temporary Radio Hole.

Rationale:

Depending on the communication architecture, the failure of system elements may prevent communication. The loss of communication will result in a loss of train position reports generating safe reactions within the L3 Trackside which may be undesirable or unnecessary. Informing the system that there is a temporary radio hole manages this issue.

Guidance:

In the event that the radio network is not working, the Dispatcher can activate a pre-defined radio hole. The procedure to be followed will depend on the specific application, including the facilities provided within the L3 Trackside. The L3 Trackside will establish a temporary EoA Exclusion Area covering the Radio Hole.

Requirements: REQ-RadioHole-1, REQ-RadioHole-2

OPE-LossComms-3

[X2R3 D4.2: OPE-LossComms-3]

The Dispatcher shall, in accordance with non-harmonised rules, deactivate a Temporary Radio Hole.

Rationale:

This is to reinstate normal operations and thus operational performance on the railway.

Guidance:

The Dispatcher will need to check that all the necessary conditions are fulfilled prior to deactivating the temporary radio hole. Any trains already holding a Movement Authority through the radio hole will continue unaffected.

Requirements: REQ-RadioHole-1

OPE-LossComms-4**[X2R3 D4.2: OPE-LossComms-4]**

When alerted by the L3 Trackside that a train has been in a radio hole for longer than expected, the Dispatcher shall apply non-harmonised rules.

Rationale:

A train detected as not having left a radio hole within the normal period of time may need assistance.

Guidance:

The action to be taken may depend on alternative communication systems and whether TTD is provided.

Requirements: REQ-RadioHole-7

2.8 Loss of train integrity

2.8.1 Introduction

The loss of train integrity may occur for a number of reasons but in the event that a train is unintentionally divided the Dispatcher needs to take relevant steps to protect the potentially hazardous situation.

2.8.2 Rules

OPE-LossTI-1**[X2R3 D4.2: OPE-LossTI-1]**

When advised of loss of train integrity, the Dispatcher shall, in accordance with non-harmonised rules, protect the area in which a train division may have occurred.

Rationale:

A Level 3 system primarily relies on position reports including integrity information from trains to establish the status of the railway and to decide when a Movement Authority may be issued. If a train reports that integrity has been lost, then the Dispatcher needs to be alerted so they can take appropriate action.

Guidance:

The required actions may be to contact the Driver, to issue an emergency stop order to other trains in the area, to make an emergency voice call or to establish a track

status Unknown Area to prevent other trains approaching the divided train. The rules should take account of the potential that a division of the train is caused by the derailment of part of the train which may be obstructing adjacent lines.

Requirements: REQ-TrackStatus-22; REQ-TrackStatus-23

OPE-LossTI-2**[X2R3 D4.2: OPE-LossTI-2]**

When advised of loss of train integrity through an in-cab indication, the Driver shall follow non-harmonised rules.

Rationale:

A Level 3 system primarily relies on position reports including integrity information from trains to establish the status of the railway and to decide when a Movement Authority may be issued. If a train reports that integrity has been lost, then the Driver needs to react in an appropriate manner.

Guidance:

The required actions may be to stop the train, to contact the Dispatcher, to visually inspect the system, and/or reset the TIMS.

Requirements: REQ-LossTI-6

2.9 Recovery

2.9.1 Introduction

When trains fail, they may not be able to communicate their position and integrity status. If they are rescued by other trains, then the ETCS Train Data may not be complete, leading to the L3 Trackside being unable to determine when the railway is clear. Non-harmonised Operational Rules will be required to manage the rescue of failed trains.

2.9.2 Rules

OPE-REC-1**[X2R3 D4.2: OPE-REC-1]**

The Driver of the rescue train shall, in accordance with non-harmonised rules, confirm train integrity for the combined train when having reached a standstill at a station or designated location previously agreed with the Dispatcher.

Rationale:

A rescue train cannot report train integrity confirmed for the complete train; the Driver of the rescue train must confirm it.

Guidance:

The Rule should include the conditions under which the Driver of the rescue train is allowed to confirm train integrity. It is expected that the location at which the Driver will confirm train integrity will be agreed in advance with the Dispatcher who may need to provide protection to the Driver to enable them to walk to the rear of the train. This could be, for example, by the Driver checking the rear of the train or this being done by additional staff in a station or yard. In Level 3, the location of a train is solely dependent on the position and integrity report from the train – an erroneous integrity confirmation by the Driver could lead to the line remaining obstructed but considered Clear.

The Driver confirmation could be done either verbally or on the DMI.

Requirements: None