Richtlijn

ETCS System Compatibility (ESC)

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INHOUD

1 Revision information

Date	Version	Chapter / paragraph	Change
08-04-2020	V001	All sections	First final version

2   General

This document describes the ProRail ESC checks as defined in Commission Implementing Regulation (EU) 2019/776 of 16 May 2019.

2.1   Language

To facilitate the use of the content of this document on EU level, the document has been written as much as possible in the English language.

2.2   Scope

The ESC checks cover:
1.   ERTMS onboard equipment used on ERTMS trackside
2.   ERTMS onboard equipment used on Class B trackside which is additionally (partly) equipped with ERTMS trackside equipment

The following references are used:

Reference	Document
TSI CCS	COMMISSION IMPLEMENTING REGULATION (EU) 2019/776 of 16 May 2019 amending Commission Regulations (EU) No 321/2013, (EU) No 1299/2014, (EU) No 1301/2014, (EU) No 1302/2014, (EU) No 1303/2014 and (EU) 2016/919 and Commission Implementing Decision 2011/665/EU as regards the alignment with Directive (EU) 2016/797 of the European Parliament and of the Council and the implementation of specific objectives set out in Commission Delegated Decision (EU) 2017/1474
Application Guide TSI CCS (including Principles doc)	Guide for the application of the CCS TSI Version 6.0 – 20/12/2019
TVG00559-V008	ERTMS level 2 beveiligingsinstallatie Zevenaar-Oost (- Emmerich) en Betuweroute A15-tracé.
VRF60561-3-V002 (TVG00405-V001)	Vrijgave Betuweroute A15 ERTMS L2 2.3.0d
VRF60561-4-V001 (TVG00382-V008)	Vrijgave Hanzelijn ERTMS L2 systeem
VRF60561-2-V002 (TVG00228-V001)	Vrijgave ERTMS L1 Havenspoorlijn en Kijfhoek
TvG00310-V020	Amsterdam- Utrecht Bev21 SR5.10.2 (SR5-10-2), 27 maart 2019

2.3   Terms and abbreviations / Definities en afkortingen

Term	Verklaring (Nederlands)	Explanation (English)
A-U	Level 2/Level NTC-ATB Amsterdam – Utrecht	Overlay track ERTMS Level 2 with Level NTC-ATB from Amsterdam to Utrecht
ATB	Automatische treinbeïnvloeding – Nederlandse treinbeïnvloedingssysteem	Dutch Class B system
CUP	rangeer locatie Betuweroute, Container Uitwissel Punt (Valburg)	Yard location on Betuweroute
Betuwer oute	Level 2 Betuweroute van Kijfhoek tot grens Duisland	ERTMS Level 2 only track for mainly freight trains from Rotterdam (Kijfhoek) to the German border (Emmerich)
HSL-South	HSL-Zuid	ERTMS Level 2 with fall back Level 1 track for highspeed passenger trains from Amsterdam

ProRail

ETCS System Compatibility (ESC)

Term	Verklaring (Nederlands)	Explanation (English)
		via Rotterdam to the Belgium border (HSL-South)
HZL	Level 2/Level NTC-ATB Hanzelijn	Overlay track ERTMS Level 2 with Level NTC-ATB from Zwolle to Lelystad (Hanzelijn)
In advance	Geen letterlijke vertaling mogelijk, vergelijkbaar in het Nederlands met de term: achter het sein	A term indicating a spot beyond a specific location on the track, see Subset-023
In rear	Geen letterlijke vertaling mogelijk, vergelijkbaar in het Nederlands met de term: voor het sein	A term indicating a spot on the approach to a specific location on the track, see Subset-023
Level NTC	Level voor Nationaal treinbeïnvloedingssysteem (B2: Level STM)	Level for National Train Control (for onboards with B2: Level STM)
NORM	Normale rijweginstelling	Normal route
NTC-ATB	Nederlands ATB system gebruik makend van NID_NTC=ATB	Dutch National train control with NID_NTC=ATB
PZB, LZB	Duitse conventionele trein beheersingssystemen	German Class B systems
ROZ	Op zicht rijweginstelling	On sight route
TBL1, TBL1+, TBL2, Memor, KVB	Belgische conventionele trein beheersingssystemen	Belgium Class B systems
Train	Geen Nederlandse term gebruikt. Engelstalige term in gebruik	Train can be read as trainset or locomotive

3 Process

3.1 Process

ProRail works according to the document "Principles for the demonstration of ETCS system compatibility" as included in the TSI CCS Application guide. The roles in the ESC process will be assigned to the involved parties on a project (case-by-case) basis.

The ESC checks consist of two parts:

1. Execution of test scenarios
2. Analysis of the impact of the onboard behaviour in combination with the Dutch ERTMS track sides regarding:
    a. the onboard error corrections which have been published as result of the ERA ERTMS CCM process;
    b. exported constraints, limitations for use etc. from the onboard.

The email address for ESC check requests is: inzet.spoorvoertuigen@prorail.nl

3.2 Test location

ProRail has specified in this document the operational scenarios which are applicable for all track with ERTMS equipment within the Netherlands. This document does not contain any detailed trackside information like track layout, balise content, etc.

ProRail has for most of the checks the ProRail lab test facilities available to perform the operational test scenario´s described in this document. As an alternative to the lab test facilities, onsite test can be performed on the trackside.

3.3 Version Management of this document

This document has been written with the best knowledge at this moment. At any moment in time, ProRail has the right to modify this document, e.g. due to feedback from experience and knowledge.

3.4 Interoperability Constituents versus Subsystem

The ESC checks described in this document do not require specific parameter configurations for the onboard Interoperability Constituent(s) or Subsystem unless stated otherwise. ProRail doesn't require that the ESC checks are performed on the level of the Subsystem. However, the applicant has to provide evidence that the results of the ESC checks on the level of Interoperability Constituents are valid for the concerned onboard Subsystem configuration.

4 ESC-types Operational scenarios (overview)

ProRail has defined the ESC types in such way that it facilitates the intended use of the ERTMS vehicle on the network. E.g. for the infrastructure which is equipped with both Class B and ERTMS Level 2, two ESC types have been defined. One for ERTMS vehicles running on the line in Level 2 and one for ERTMS vehicles running on the line in Class B (these ERTMS vehicles will still set up a connection with the RBC at the entrance of the line although this connection is terminated by the RBC shortly after). This leads for the current ERTMS infrastructure in the Netherlands to the following ESC types.

ESC types:
- ESC-type: Class B track Betuweroute connections (Meteren / Elst)
- ESC-type: Class B track Betuweroute connections (Zevenaar)
- ESC-type: Class B track Hanzelijn connections
- ESC-type: Class B track Hanzelijn overlay Level 2
- ESC-type: Class B track HSL-South connections
- ESC-type: Class B track Amsterdam-Utrecht connections
- ESC-type: Class B track Amsterdam-Utrecht overlay Level 2
- ESC-type: Class B track border Germany
- ESC-type: Class B track border Belgium
- ESC-type: ERTMS track Havenspoorlijn – Kijfhoek
- ESC-type: ERTMS track Havenspoorlijn – Kijfhoek transition from/to ATB
- ESC-type: ERTMS track Kijfhoek – BetuweRoute transition Level 1 from/to Level 2
- ESC-type: ERTMS track BetuweRoute – Zevenaar Oost
- ESC-type: ERTMS track BetuweRoute – Zevenaar Oost transition Meteren and Elst
- ESC-type: ERTMS track BetuweRoute – Zevenaar Oost transition Zevenaar
- ESC-type: ERTMS track Zevenaar Oost – border Germany
- ESC-type: ERTMS track Hanzelijn
- ESC-type: ERTMS track Hanzelijn transitions Level 2
- ESC-type: ERTMS track HSL-South
- ESC-type: ERTMS track HSL-South transitions
- ESC-type: ERTMS track HSL-South border Belgium
- ESC-type: ERTMS track Amsterdam – Utrecht
- ESC-type: ERTMS track Amsterdam – Utrecht transitions Level 2

This chapter contains for each ESC type the operational scenarios which are covered in this document. The next chapter contains the details for each operational scenario. Each id in the tables corresponds to a section in the next chapter, e.g. 5.1.1.1 in section 4.1 corresponds to section 5.1.1.1.

4.1 ESC-type: Class B track Betuweroute connections (Meteren / Elst)

This section contains all operational scenarios for running on Class B track in which balises have been installed to connect / disconnect with the ERTMS Level 2 system of the Betuweroute locations Meteren and Elst.

Id	Title
5.1.1.1	Crossing ERTMS track BetuweRoute – Zevenaar Oost

Table 4.1-1 List of scenarios for Class B track Betuweroute connections (Meteren / Elst)

4.2   **ESC-type: Class B track Betuweroute connections (Zevenaar)**

This section contains all operational scenarios for running on Class B track in which balises have been installed to connect / disconnect with the ERTMS Level 2 system of the Betuweroute location Zevenaar.

Id	Title
5.1.1.2	Crossing ERTMS track Zevenaar Oost – border Germany

Table 4.2-1 List of scenarios for Class B track Betuweroute connections (Zevenaar)

4.3   **ESC-type: Class B track Hanzelijn connections**

This section contains all operational scenarios for running on Class B track in which balises have been installed to connect / disconnect with the ERTMS Level 2 system of the Hanzelijn.

Id	Title
5.1.1.3	Crossing ERTMS track Hanzelijn

Table 4.3-1 List of scenarios for Class B track Hanzelijn connections

4.4   **ESC-type: Class B track Hanzelijn overlay Level 2**

This section contains all operational scenarios for running on the Hanzelijn in Class B operation.

Id	Title
5.1.2	Running over an ERTMS overlay track in NTC-ATB

Table 4.4-1 List of scenarios for Class B track Hanzelijn overlay Level 2

4.5   **ESC-type: Class B track HSL-South connections**

This section contains all operational scenarios for running on Class B track in which balises have been installed to connect / disconnect with the ERTMS Level 2 system of HSL-South.

Id	Title
5.1.1.4	Crossing ERTMS track HSL - South

Table 4.5-1 List of scenarios for Class B track HSL-South connections

4.6   **ESC-type: Class B track Amsterdam-Utrecht connections**

This section contains all operational scenarios for running on Class B track in which balises have been installed to connect / disconnect with the ERTMS Level 2 system of the Amsterdam-Utrecht trackside.

Id	Title
5.1.1.5	Crossing ERTMS track Amsterdam – Utrecht

Table 4.6-1 List of scenarios for Class B track Amsterdam-Utrecht connections

4.7   **ESC-type: Class B track Amsterdam-Utrecht overlay Level 2**

This section contains all operational scenarios for running on the Amsterdam-Utrecht in Class B operation.

Id	Title
5.1.2	Running over an ERTMS overlay track in NTC-ATB

Table 4.7-1 List of scenarios for Class B track Amsterdam-Utrecht overlay Level 2

4.8   **ESC-type: Class B track border Germany**

This section contains all operational scenarios for running on border crossings Netherlands-Germany where ERTMS balises have been installed to facilitate the transitions from and to the Class B systems.

Id	Title
5.1.3.1	Normal transition from NTC-ATB to NTC-YYY
5.1.3.2	Normal transition from NTC-XXX to NTC-ATB

Id	Title
5.1.3.3	Degraded transition from NTC-XXX to NTC-ATB
5.1.3.4	Transition into The Netherlands when failure NTC-ATB

Table 4.8-1 List of scenarios for Class B track border Germany using Class B

4.9 ESC-type: Class B track border Belgium
This section contains all operational scenarios for running on border crossings Netherlands-Belgium where ERTMS balises have been installed to facilitate the transitions from and to the Class B systems.

Id	Title
5.1.3.1	Normal transition from NTC-ATB to NTC-YYY
5.1.3.2	Normal transition from NTC-XXX to NTC-ATB
5.1.3.3	Degraded transition from NTC-XXX to NTC-ATB
5.1.3.4	Transition into The Netherlands when failure NTC-ATB

Table 4.9-1 List of scenarios for Class B track border Belgium using Class B

4.10 ESC-type: ERTMS track Havenspoorlijn – Kijfhoek
This section contains all operational scenarios for running on the ERTMS equipped track Havenspoorlijn and Kijfhoek.

Id	Title	Sub scenario
5.2.1	Confidence run over complete track	Id 2,3,4
5.2.3	Running in OS	
5.2.6	Mode Transition to Shunting (for NORM or ROZ route)	
5.2.7	Signal passed at danger	

Table 4.10-1 List of scenarios for ERTMS track Havenspoorlijn – Kijfhoek

4.11 ESC-type: ERTMS track Havenspoorlijn – Kijfhoek transition from/to ATB
This section contains all operational scenarios for running on the ERTMS transition from/to ATB equipped track Havenspoorlijn and Kijfhoek.

Id	Title	Sub scenario
5.2.1	Confidence run over complete track	Id 1,5
5.2.2	Exit when failure NTC-ATB	
5.2.4	Entrance specialties from ATB to ERTMS	
5.2.5	Exit specialties to ATB	

Table 4.11-1 List of scenarios for ERTMS track Havenspoorlijn – Kijfhoek transition from/to ATB

4.12 ESC-type: ERTMS track Kijfhoek – BetuweRoute transition Level 1 from/to Level 2
This section contains all operational scenarios for running on the ERTMS transition Level 1 from/to Level 2 equipped track Kijfhoek and BetuweRoute.

Id	Title	Sub scenario
5.4.1	Confidence run over complete track	Id 1,7
5.3.1	Transition Level 1 -> Level 2: Late connection	

Table 4.12-1 List of scenarios for ERTMS track Kijfhoek – BetuweRoute transition Level 1 from/to Level 2

4.13 ESC-type: ERTMS track BetuweRoute – Zevenaar Oost
This section contains all operational scenarios for running on the ERTMS equipped track BetuweRoute and Zevenaar Oost.

Id	Title	Sub scenario
5.4.1	Confidence run over complete track	Id 2,5,6
5.4.3	Running in OS	
5.4.6	Movement revocation	
5.4.7	Override (STS passage)	
5.4.8	Signal passed at danger	
5.4.9	Change direction	
5.4.10	RBC Handover with one active modem	

Table 4.13-1 List of scenarios for ERTMS track BetuweRoute – Zevenaar Oost

4.14   ESC-type: ERTMS track BetuweRoute – Zevenaar Oost transition Meteren and Elst

This section contains all operational scenarios for running on the ERTMS equipped track BetuweRoute and Zevenaar Oost, transition Meteren and Elst.

Id	Title
5.4.2	Exit when failure NTC-ATB
5.4.4	Entrance specialties from ATB to ERTMS
5.4.5	Exit specialties to ATB

Table 4.14-1 List of scenarios for ERTMS track BetuweRoute – Zevenaar Oost transition Meteren and Elst

4.15   ESC-type: ERTMS track BetuweRoute – Zevenaar Oost transition Zevenaar

This section contains all operational scenarios for running on the ERTMS equipped track BetuweRoute and Zevenaar Oost, transition Zevenaar.

Id	Title	Sub scenario
5.5.1	Confidence run over complete track	Id 1,4
5.4.2	Exit when failure NTC-ATB	
5.4.4	Entrance specialties from ATB to ERTMS	
5.4.5	Exit specialties to ATB	

Table 4.15-1 List of scenarios for ERTMS track BetuweRoute – Zevenaar Oost transition Zevenaar

4.16   ESC-type: ERTMS track Zevenaar Oost – border Germany

This section contains all operational scenarios for running on the ERTMS equipped track Zevenaar Oost including the border with Germany.

Id	Title	Sub scenario
5.4.1	Confidence run over complete track	Id 3,4
5.5.1	Confidence run over complete track	Id 2,3
5.5.2	Exit when failure NTC-PZB	

Table 4.16-1 List of scenarios for ERTMS track Zevenaar Oost border Germany

4.17   ESC-type: ERTMS track Hanzelijn

This section contains all operational scenarios for running on the ERTMS equipped track Hanzelijn.

Id	Title	Sub scenario
5.6.1	Confidence run over complete track	Id 2,5,6
5.6.3	Running in OS	
5.6.6	Movement revocation	
5.6.7	Override (STS passage)	
5.6.8	Signal passed at danger	
5.6.9	Change direction	

Table 4.17-1 List of scenarios for ERTMS track Hanzelijn

4.18   ESC-type: ERTMS track Hanzelijn transitions Level 2
This section contains all operational scenarios for running on the ERTMS equipped track Hanzelijn, transitions.

Id	Title	Sub scenario
5.6.1	Confidence run over complete track	Id 1,3,4,7
5.6.2	Exit when failure NTC-ATB	
5.6.4	Entrance specialties from ATB to ERTMS	
5.6.5	Exit specialties to ATB	

Table 4.18-1 List of scenarios for ERTMS track Hanzelijn transitions Level 2

4.19   ESC-type: ERTMS track HSL-South
This section contains all operational scenarios for running on the ERTMS equipped track HSL-South.

Id	Title	Sub scenario
5.7.1	Confidence run over complete track	Id 2,3,6,7
5.8.1	Confidence run over complete track	Id 1,4
5.7.3	Running in OS	
5.7.6	Override (STS passage)	
5.7.7	Signal passed at danger	

Table 4.19-1 List of scenarios for ERTMS track HSL-South

4.20   ESC-type: ERTMS track HSL-South transitions
This section contains all operational scenarios for running on the ERTMS equipped track HSL-South, transitions.

Id	Title	Sub scenario
5.7.1	Confidence run over complete track	Id 1,4,5,8
5.7.2	Exit when failure NTC-ATB	
5.7.4	Entrance specialties from ATB to ERTMS	
5.7.5	Exit specialties to ATB	

Table 4.20-1 List of scenarios for ERTMS track HSL-South transitions

4.21   ESC-type: ERTMS track HSL-South border Belgium
This section contains all operational scenarios for running on the ERTMS equipped track HSL-South including the border with Belgium.

Id	Title	Sub scenario
5.8.1	Confidence run over complete track	Id 2,3
5.8.2	RBC Handover with one active modem	

Table 4.21-1 List of scenarios for ERTMS track HSL-South border Belgium

4.22   ESC-type: ERTMS track Amsterdam – Utrecht
This section contains all operational scenarios for running on the ERTMS equipped track Amsterdam - Utrecht.

Id	Title	Sub scenario
5.9.1	Confidence run over complete track	Id 2,5,6
5.9.3	Running in OS	
5.9.6	Movement revocation	
5.9.7	Override (STS passage)	

Id	Title	Sub scenario
5.9.8	Signal passed at danger	
5.9.9	Change direction	

Table 4.22-1 List of scenarios for ERTMS track Amsterdam – Utrecht

4.23 ESC-type: ERTMS track Amsterdam – Utrecht transitions Level 2

This section contains all operational scenarios for running on the ERTMS equipped track Amsterdam – Utrecht, transitions.

Id	Title	Sub scenario
5.9.1	Confidence run over complete track	Id 1,3,4,7
5.9.2	Exit when failure NTC-ATB	
5.9.4	Entrance specialties from ATB to ERTMS	
5.9.5	Exit specialties to ATB	

Table 4.23-1 List of scenarios for ERTMS track Amsterdam – Utrecht transitions Level 2

5   Operational scenarios (detailed)

In the following sections the operational scenarios are described in detail. Optionally a scenario is explained in a situation drawing. These drawings are oriented left to right, where at the start location the train is drawn in full colour and the end location the train is drawn in dotted lines. Each section has a table with scenario steps. In addition to this table optional tables may be present. The steps in this document must be seen as actions to be performed or functionality to be verified. The description of the step will make this distinction clear.

In general, the steps are sequentially numbered to determine the order of execution, however due to dynamic behaviour sequence changes are possible. Steps are given a character in addition to the number, e.g. 1a or 1b, if steps are at the same location/time but not applicable for all situations.

Some onboard behaviour is baseline dependent. Currently the following baselines are distinguished:
- Baseline 2 (B2)
- Baseline 3 Maintenance Release 1 (B3MR1)
- Baseline 3 Release 2 (B3R2)
- Baseline 3 Release 2 including ERA Opinion 2017-2 (B3R2+Art10SP2017).

DMI for the Class B system could be integrated into the ETCS DMI or could be separated with dedicated ATB cab display. In the test steps the term "DMI"" is used for both options.
Signals could be lineside signals or stop maker boards (SMB).

5.1   Class B track

5.1.1   Crossing an ERTMS track when route remains on Class B system using NTC-ATB

5.1.1.1   Crossing ERTMS track BetuweRoute – Zevenaar Oost

This scenario must be performed without a valid key for these ERTMS tracks.
This scenario is applicable at the geographical locations:

Geographical location	Class B track	ERTMS track
Meteren	Geldermalsen – 's Hertogenbosch	BetuweRoute: Zevenaar - Kijfhoek
Elst	Arnhem – Nijmegen	BetuweRoute: Zevenaar - Kijfhoek

Table 5.1-1 Geographical locations
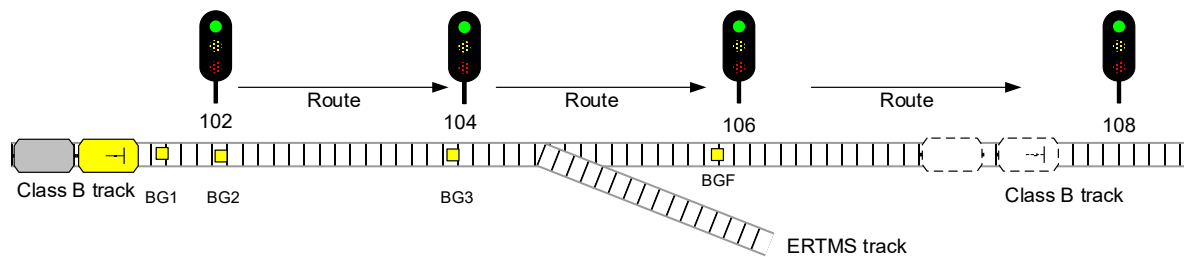
Figure 5.1-1 Situation

Id	Main function
BG1	Network registration
BG2	Setup communication with RBC
BG3[1]	Level transition to Level 2 or Cancel transition (i.e. new transition to Level NTC)
BGF	(redundant) Cancel transition (i.e. new transition to Level NTC), disconnection order RBC

Table 5.1-2 Description of balises

The scenario is described in detail in Table 5.1-3. The dispatcher has to set the route from the start location on the Class B track to the end location on the Class B track with the requirement that the entrance to the ERTMS track is passed by (crossed) between start and destination. Table 5.1-1 contains the geographical locations for this test case. Table 5.1-2 describes the main functions of the passed balise groups. Some balise groups contain redundant function of previous passed balise groups.

The driver has to operate the train according to the operational rules. Note that the location of the signals is not relevant for executing this scenario.

This operational scenario shall also be executed for multiple train operation, where the onboard entity under test is the non-leading engine (i.e. mode Sleeping or Non Leading). If the train is equipped with two onboard s it is sufficient to perform the test with only one train under the condition that evidence can be supplied that the behaviour of this sleeping or non-leading onboard is not altered in a multiple train operation.

The following steps must be performed.

Step	Action / control	Leading engine	Non-leading engine
Pre	- Level is Level NTC-ATB - Mode is starting mode: - Route is set between start and destination	SN	SL / NL

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[1] The NID_BG value depends on the actual route.

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Step	Action / control	Leading engine	Non-leading engine
1	When passing BG1 with Network registration information (if BG present), verify that: a. modem is registered to the Dutch Network	x	x
2	When passing BG2 with Session management information, verify that: a. DMI shows connection setup with the RBC (not mode SL) (only for onboard with B2) b. DMI shows connection is not established (due no valid key) (not mode SL) c. In mode SL with Q_SLEEPSESSION =1, connection is setup and not established (due no valid key)	x	x
3	When passing BG3 with level transition order to Level 2 (if function not cancel transition), verify that: a. DMI shows level transition announcement to Level 2 (not mode SL)	x	x
4	When passing BGF, Verify that: a. DMI shows level remaining Level NTC-ATB (not mode SL) b. DMI shows mode remaining starting mode (not mode SL) c. In mode SL, DMI is in sleeping state	SN	SL / NL

Table 5.1-3 Scenario steps

5.1.1.2   Crossing ERTMS track Zevenaar Oost – border Germany

This scenario must be performed without a valid key for these ERTMS tracks.
This scenario is applicable at the geographical locations:

Geographical location	Class B track	ERTMS track
Zevenaar	Winterswijk - Zevenaar[2]	BetuweRoute Zevenaar

Table 5.1-4 Geographical locations
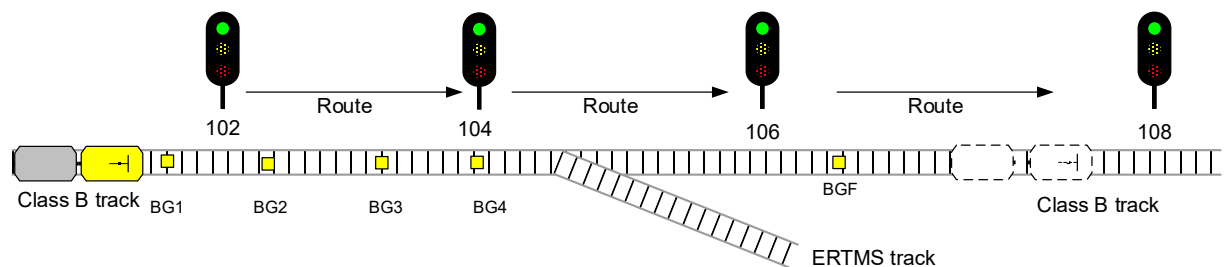
Figure 5.1-2 Situation

Id	Main function
BG1	Network registration
BG2	Setup communication with RBC
BG3	Setup communication with RBC (redundant)
BG4	Cancel transition (i.e. new transition Level NTC), disconnection order RBC
BGF	Redundant cancel transition (i.e. new transition Level NTC), disconnection order RBC

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[2] The major part of this route is operated under ATBNG. In rear of the crossing with the ERTMS track a "transition from NG to EG is made (and in opposite direction from EG to NG).

Table 5.1-5 Description of balises

The scenario is described in detail in Table 5.1-6. The dispatcher has to set the route from the start location on the Class B track to the end location on the Class B track with the requirement that an entrance to the ERTMS track is passed by (crossed) between start and destination. Table 5.1-4 contains the geographical locations for this test case. Table 5.1-5 describes the main functions of the passed balise groups. Some balise groups contain redundant function of previous passed balise groups.

The driver has to operate the train according to the operational rules. Note that the location of the signals is not relevant for executing this scenario.

This operational scenario shall also be executed for multiple train operation, where the onboard entity under test is the non-leading engine (i.e. mode Sleeping or Non Leading). If the train is equipped with two onboards it is sufficient to perform the test with only one train under the condition that evidence can be supplied that the behaviour of this sleeping or non-leading onboard is not altered in a multiple train operation.

The following steps must be performed.

Step	Action / control	Leading engine	Non-leading engine
Pre	• Level is Level NTC-ATB • Mode is starting mode • Route is set between start and destination	SN	SL / NL
1	When passing BG1 with Network registration information, verify that: a. modem is registered to the Dutch Network	x	x
2	When passing BG2 with Session management information, verify that: a. DMI shows connection setup with the RBC (not mode SL) (only for onboard with B2) b. DMI shows connection is not established (due no valid key) (not mode SL) c. In mode SL with Q_SLEEPSESSION =1, connection is setup and not established (due no valid key)	x	x
3	When passing BGF, Verify that: a. DMI shows level remaining Level NTC-ATB (not mode SL) b. DMI shows mode remaining starting mode (not mode SL) c. In mode SL, DMI is in sleeping state	SN	SL / NL

Table 5.1-6 Scenario steps

5.1.1.3   Crossing ERTMS track Hanzelijn
This scenario must be performed without a valid key for these ERTMS tracks.
This scenario is applicable at the geographical locations:

Geographical location	Class B track	ERTMS track
Lelystad	Lelystad (opstel) - Almere	Hanzelijn: Zwolle - Lelystad
Hattemmerbroek	Zwolle - Amersfoort	Hanzelijn: Zwolle - Lelystad

Table 5.1-7 Geographical locations
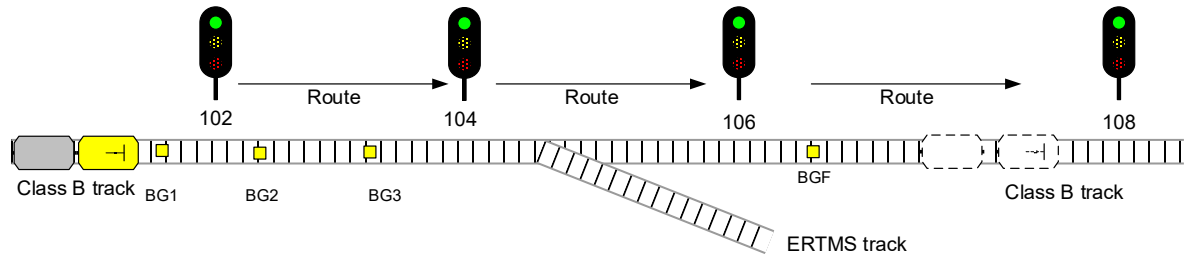
Figure 5.1-3 Situation

Id	Main function
BG1	Network registration
BG2	Setup communication with RBC
BG3	Setup communication with RBC (redundant)
BGF	Cancel transition (i.e. new transition to level), disconnection order RBC

Table 5.1-8 Description of balises

The scenario is described in detail in Table 5.1-9. The dispatcher has to set the route from the start location on the Class B track to the end location on the Class B track with the requirement that an entrance to the ERTMS track is passed by (crossed) between start and destination. Table 5.1-7 contains the geographical locations for this test case. Table 5.1-8 describes the main functions of the passed balise groups. Some balise groups contain redundant function of previous passed balise groups.

The driver has to operate the train according to the operational rules. Note that the location of the signals is not relevant for executing this scenario.

This operational scenario shall also be executed for multiple train operation, where the onboard entity under test is the non-leading engine (i.e. mode Sleeping or Non Leading). If the train is equipped with two onboards it is sufficient to perform the test with only one train under the condition that evidence can be supplied that the behaviour of this sleeping or non-leading onboard is not altered in a multiple train operation.

The following steps must be performed.

Step	Action / control	Leading engine	Non-leading engine
Pre	• Level is Level NTC-ATB • Mode is starting mode • Route is set between start and destination	SN	SL / NL
1	When passing BG1 with Network registration information (if BG present), verify that: a. modem is registered to the Dutch Network	x	x
2	When passing BG2 with Session management information, verify that: a. DMI shows connection setup with the RBC (not mode SL) (only for onboard with B2) b. DMI shows connection is not established (due no valid key) (not mode SL) c. In mode SL with Q_SLEEPSESSION =1, connection is setup and not established (due no valid key)	x	x
3	When passing BGF, verify that: a. DMI shows level remaining Level NTC-ATB (not mode SL) b. DMI shows mode remaining starting mode (not mode SL) c. In mode SL, DMI is in sleeping state	SN	SL / NL

Table 5.1-9 Scenario steps

5.1.1.4 Crossing ERTMS track HSL - South

This scenario must be performed without a valid key for these ERTMS tracks.
This scenario is applicable at the geographical locations:

Geographical location	Class B track	ERTMS track
Zevenbergschenhoek	Dordrecht - Breda	HSL-South
Rotterdam Lombardijen	Rotterdam Zuid - Dordrecht	HSL-South
Rotterdam West	Delft - Rotterdam	HSL-South
Hoofddorp	Schiphol – Nieuw Vennep	HSL-South

Table 5.1-10 Geographical locations
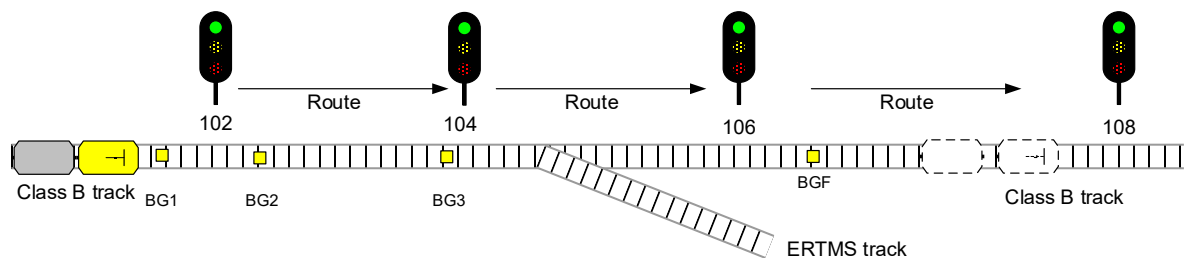
Figure 5.1-4 Situation

At the geographical locations Rotterdam West and Rotterdam Lombardijen in all the routes passing the ERTMS track the trackside does not transmit an RBC session connection order. At these locations steps 2 to 3 from this testcase do not apply.

Id	Main function
BG1	Network registration
BG2	Setup communication with RBC
BG3	Cancel transition (i.e. new transition to Level NTC),
BGF	Cancel transition (i.e. new transition to Level NTC), disconnection order RBC

Table 5.1-11 Description of balises

The scenario is described in detail in Table 5.1-12. The dispatcher has to set the route from the start location on the Class B track to the end location on the Class B track with the requirement that an entrance to a Dutch ERTMS track is passed by (crossed) between start and destination. Table 5.1-10 contains the geographical locations for this test case. Table 5.1-11 describes the main functions of the passed balise groups. Some balise groups contain redundant function of previous passed balise groups.

The driver has to operate the train according to the operational rules. Note that the location of the signals is not relevant for executing this scenario.

This operational scenario shall also be executed for multiple train operation, where the onboard entity under test is the non-leading engine (i.e. mode Sleeping or Non Leading). If the train is equipped with two onboards it is sufficient to perform the test with only one train under the condition that evidence can be supplied that the behaviour of this sleeping or non-leading onboard is not altered in a multiple train operation.

The following steps must be performed.

Step	Action / control	Leading engine	Non-leading engine
Pre	• Level is Level NTC-ATB • Mode is starting mode • Route is set between start and destination	SN	SL/ NL

Step	Action / control	Leading engine	Non-leading engine
1	When passing BG1 with Network registration information (if BG present), verify that: a. modem is registered to the Dutch Network	x	x
2	When passing BG2 with Session management information, verify that: a. DMI shows connection setup with the RBC (not mode SL) (only for onboard with B2) b. DMI shows connection is not established (due no valid key) (not mode SL) c. In mode SL with Q_SLEEPSESSION =1, connection is setup and not established (due no valid key)	x	x
3	When passing BGF, verify that: a. DMI shows level remaining Level NTC-ATB (not mode SL) b. DMI shows mode remaining starting mode (not mode SL) c. In mode SL, DMI is in sleeping state	SN	SL / NL

Table 5.1-12 Scenario steps

5.1.1.5 Crossing ERTMS track Amsterdam – Utrecht

This scenario must be performed without a valid key for these ERTMS tracks.
This scenario is applicable at the geographical locations:

Geographical location	Class B track	ERTMS track
Duivendrecht	Amsterdam Zuid – Diemen Zuid	Amsterdam - Utrecht
Utrecht	Utrecht – Utrecht Cartesiusweg	Amsterdam - Utrecht

Table 5.1-13 Geographical locations
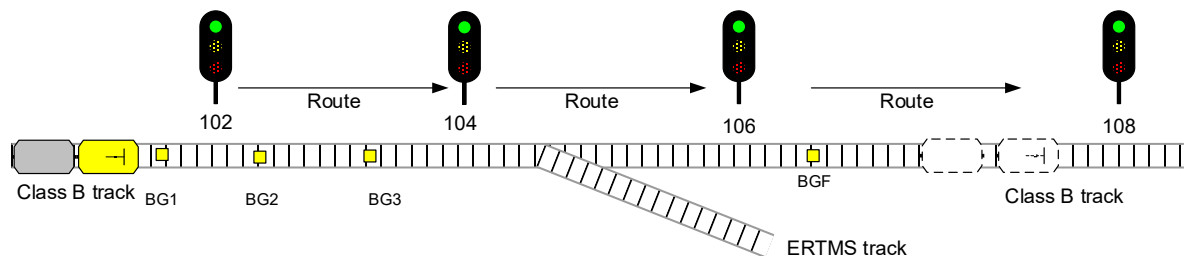
Figure 5.1-5 Situation

Id	Main function
BG1	Network registration
BG2	Setup communication with RBC
BG3	Setup communication with RBC (redundant)
BGF	Disconnection order RBC

Table 5.1-14 Description of balises

The scenario is described in detail in Table 5.1-15. The dispatcher has to set the route from the start location on the Class B track to the end location on the Class B track with the requirement that the entrance to the ERTMS track is passed by (crossed) between start and destination. Table 5.1-13 contains the geographical locations for this test case. Table 5.1-14 describes the main functions of the passed balise groups. Some balise groups contain redundant function of previous passed balise groups.

The driver has to operate the train according to the operational rules. Note that the location of the signals is not relevant for executing this scenario.

This operational scenario shall also be executed for multiple train operation, where the onboard entity under test is the non-leading engine (i.e. mode Sleeping or Non Leading). If the train is equipped with two onboards it is sufficient to perform the test with only one train under the condition that evidence can be supplied that the behaviour of this sleeping or non-leading onboard is not altered in a multiple train operation.

The following steps must be performed.

Step	Action / control	Leading engine	Non-leading engine
Pre	• Level is Level NTC-ATB • Mode is starting mode • Route is set between start and destination	SN	SL / NL
1	When passing BG1 with Network registration information (if BG present), verify that: a. modem is registered to the Dutch Network	x	x
2	When passing BG2 with Session management information, verify that: a. DMI shows connection setup with the RBC (not mode SL) (only for onboard with B2) b. DMI shows connection is not established (due no valid key) (not mode SL) c. In mode SL with Q_SLEEPSESSION =1, connection is setup and not established (due no valid key)	x	x
3	When passing BGF, verify that: a. DMI shows level remaining Level NTC-ATB (not mode SL) b. DMI shows mode remaining starting mode (not mode SL) c. In mode SL, DMI is in sleeping state	SN	SL / NL

Table 5.1-15 Scenario steps

5.1.2   Running over an ERTMS overlay track in NTC-ATB

The tracks Amsterdam - Utrecht and Hanzelijn are constructed with ERTMS Level 2 with ATB in overlay. ERTMS equipped trains without a valid key will pass these tracks in Level NTC-ATB mode SN. The scenario below must be performed without a valid key, to run on this track in Level NTC-ATB mode SN.

This scenario is to verify that all trains without an RBC key are running in Level NTC-ATB mode SN over this track. Note that also trains without ERTMS equipment can use this track as any Class B track, but these trains are out of the scope of this document.
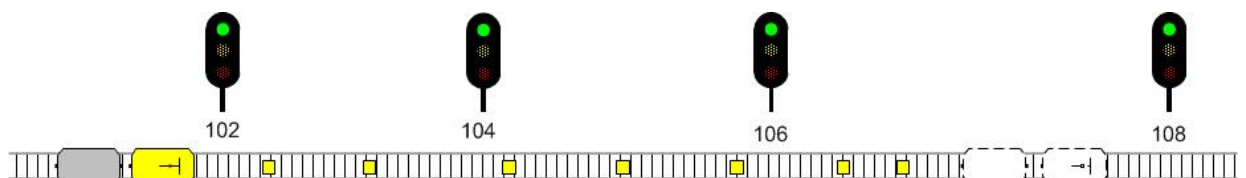

Figure 5.1-6 Situation

The track contains several balise groups which may contain different information. The scenario is running from Amsterdam to Utrecht (or vice versa) and from Lelystad to Zwolle (or vice versa) and

running all the way in Level NTC-ATB mode SN. There is one planned stop in the middle of the track, e.g. Maarssen or Dronten to perform some manual DMI actions.

The following steps must be performed.

Step	Action / Control	A-U	HZL
Pre	• level is Level NTC-ATB • mode is SN • route is set between start and destination	x	x
1	When passing BG with Network registration information (if BG present), verify that: a. modem is registered to the Dutch Network b. no brakes applied c. DMI shows mode remaining mode SN	x	x
2	When passing BG with Session management information, verify that: a. DMI shows connection setup with the RBC (at every reception of this packet) (only for onboard with B2) b. DMI shows no connection establishment with the RBC due to invalid key c. no brakes applied d. DMI shows mode remaining mode SN	x	x
3	When passing BG with conditional level transition order information, verify that: a. DMI shows level remaining Level NTC-ATB b. no brakes applied c. DMI shows mode remaining mode SN	x	x
4	When passing BG with text message information, verify that: a. DMI shows no text because the onboard is in Level NTC-ATB b. no brakes applied c. DMI shows mode remaining mode SN	x	
5	When passing BG with Stop-If-In-SR information, verify that: a. no brakes applied b. DMI shows mode remaining mode SN	x	x
6	When passing BG with termination order, verify that: a. DMI shows no reaction because there is no connection b. no brakes applied c. DMI shows mode remaining mode SN	x	x
7	When passing BG with level transition order information, verify that: a. DMI shows level remaining Level NTC-ATB b. no brakes applied c. DMI shows mode remaining mode SN	x	x
8	When receiving National Values for braking curves, verify that: • for non-System Version 1.1 compatible onboards National Values for braking curves is discarded; other information of the balise groups shall be considered • for System Version 1.1 compatible onboards: all information of the balise groups shall be considered and the braking characteristics updated.	x	x
9	Train stops at station Maarssen or Dronten. Verify that: a. DMI shows in level menu only Level NTC-ATB and Level 2	x	x
10	Train continues to destination. Verify that: a. Checks steps 1 through 8	x	x
11	Train stops at Utrecht / Amsterdam or at Lelystad / Zwolle. Verify that: a. DMI shows in level menu only Level NTC-ATB.	x	x

Table 5.1-16 Scenario steps

5.1.3   National borders

For the national border scenarios, the train is running in NTC-XXX mode and makes a transition to NTC-YYY. The following figure shows the basic track layout. Note that the position of the signals is not relevant for the transition scenarios.
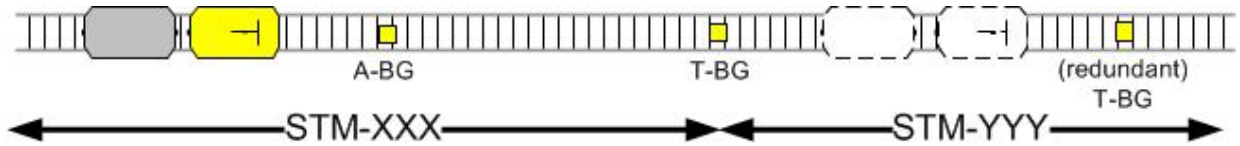
Figure 5.1-7 Border situation

The transition is announced at the A-BG (Announcement Balise Group). At the T-BG (Transition Balise Group) the actual transition takes place. For redundancy reason, at some location a redundant A-BG and T-BG are placed with the same transition information as respectively the A-BG and T-BG. The National values could be at some locations placed in an additional balise group instead of in the A-BG and T-BG.

5.1.3.1   Normal transition from NTC-ATB to NTC-YYY

The following steps must be performed.

Step	Action / Control	Border Crossing to Belgium	Border Crossing to Germany
Pre	• level is Level NTC-ATB • mode is SN • route is set from NL into	Belgium	Germany
1	Train runs from the Netherlands towards	Belgium	Germany
2a	When passing A-BG, verify that: a. DMI shows level transition announcement to NTC-XXX	x	x

2b	When passing A-BG and T-BG contains data to be used by applications outside ERTMS/ETCS, verify that:
	  a. this data is forwarded to the relevant system
	  b. no brakes applied
		x	

3	When train front end passes start of level acknowledgement window, verify that:
	  a. DMI shows level acknowledgement request
	  b. Driver acknowledges level transition within 5 seconds after passing transition location
		x	x

4a	When passing T-BG, verify that: a. DMI shows level changes to Level NTC-XXX (available level with highest priority)	TBL1+, TBL2, TBL1, Memor or KVB	PZB, LZB or ERTMS L0

4b	When passing A-BG and T-BG contains data to be used by applications outside ERTMS/ETCS, verify that:
	  a. this data is forwarded to the relevant system
	  b. no brakes applied
		x	

ETCS System Compatibility (ESC)

Step	Action / Control	Border Crossing to Belgium	Border Crossing to Germany
5a	When passing BG with national value information, verify that: a. no brakes applied b. DMI shows mode remaining mode SN	x	x
5b	When passing BG with Network registration information (if BG present), verify that: a. modem is registered to the Dutch Network b. no brakes applied c. DMI shows mode remaining mode SN	x	x
6	When passing redundant A-BG and T-BG, verify that a. DMI shows no level acknowledgement request b. no brakes applied	x	x

Table 5.1-17 Scenario steps

5.1.3.2   Normal transition from NTC-XXX to NTC-ATB

The operational scenarios towards the Netherlands shall be performed for both ATBEG and ATBNG in case the onboard supports both ATB systems.

The following steps must be performed.

Step	Action / Control	Border Crossing from Belgium	Border Crossing from Germany
Pre-a	• level is Level NTC-XXX • mode is SN	TBL1+, TBL2, TBL1, Memor or KVB	PZB or LZB
Pre-b	route is set from NL into	Belgium	Germany
1	Train runs from Belgium/Germany towards the Netherlands towards	x	x
2a	When passing A-BG, verify that: a. DMI shows level transition announcement to NTC-XXX	x	x
2b	When passing A-BG and T-BG contains data to be used by applications outside ERTMS/ETCS, verify that: a. this data is forwarded to the relevant system b. no brakes applied	x	
3	When train front end passes start of level acknowledgement window, verify that: a. DMI shows level acknowledgement request b. Driver acknowledges level transition within 5 seconds after passing transition location	x	x
4a	When passing T-BG, verify that: a. DMI shows level changes to Level NTC-ATB b. DMI shows mode remaining mode SN	x	x

Step	Action / Control	Border Crossing from Belgium	Border Crossing from Germany
4b	When passing A-BG and T-BG contains data to be used by applications outside ERTMS/ETCS, verify that: a. this data is forwarded to the relevant system b. no brakes applied	x	
5a	When passing BG with national value information, verify that: a. no brakes applied a. DMI shows mode remaining mode SN	x	x
5b	When passing BG with Network registration information (if BG present), verify that: a. modem is registered to the Dutch Network b. no brakes applied c. DMI shows mode remaining mode SN	x	x
6	When passing redundant A-BG and T-BG, verify that a. DMI shows no level acknowledgement request b. no brakes applied	x	x

Table 5.1-18 Scenario steps

5.1.3.3 Degraded transition from NTC-XXX to NTC-ATB

This degraded scenario is similar as described in section 5.1.3.2 in case the ABG is missed e.g. due to balise group failure or reversing between the A-BG and the T-BG. Both situations are covered when starting up between the A-BG and the T-BG. The immediate transition to Level NTC-ATB is received from the T-BG without an announcement (from the A-BG). Note that this may cause a reaction from the NTC-ATB insufficient ATB code reception.

The following steps must be performed.

Step	Action / Control	Border Crossing to Belgium	Border Crossing to Germany
Pre-a	• level is Level NTC-XXX • mode is SN	TBL1+, TBL2, TBL1, Memor or KVB	PZB or LZB
Pre-b	• route is set from the Netherlands into: • train starts between A-BG and T-BG	Belgium	Germany
1	Train runs from Belgium/Germany towards the Netherlands	x	x
2a	When passing T-BG, verify that: a. DMI shows level changes to Level NTC-ATB b. DMI shows mode remaining mode SN c. DMI shows level acknowledgement request d. Driver acknowledges level transition within 5 seconds after passing transition location	x	x

Step	Action / Control	Border Crossing to Belgium	Border Crossing to Germany
2b	When passing T-BG contains data to be used by applications outside ERTMS/ETCS, verify that: a. this data is forwarded to the relevant system b. no brakes applied	x	
3a	When passing BG with national value information, verify that: a. no brakes applied b. DMI shows mode remaining mode SN	x	x
3b	When passing BG with Network registration information (if BG present), verify that: a. modem is registered to the Dutch Network b. no brakes applied c. DMI shows mode remaining mode SN	x	x
4	When passing redundant A-BG and T-BG, verify that a. DMI shows no level acknowledgement request b. no brakes applied	x	x

Table 5.1-19 Scenario steps

5.1.3.4 Transition into The Netherlands when failure NTC-ATB

For this test scenario the train shall be prepared in advance. The onboard is connected to a NTC-ATB which is in failure state and not isolated. This scenario is applicable for both Belgium and Germany.

The following steps must be performed.

Step	Action / Control	Class B track
Pre	• NTC-ATB is in failure and not isolated • Level is Level NTC-XXX, according to local Class B system	X
1	Train runs from Belgium/Germany towards the Netherlands	X
2	When passing BG with level transition order to ATB, verify that: a. DMI shows message indicating the unavailability of the NTC-ATB	X
3	When passing the level transition location, verify that: a. Brakes are applied b. DMI shows message indicating the unavailability of the NTC-ATB	X

Table 5.1-20 Scenario step

5.2 ERTMS track Havenspoorlijn – Kijfhoek

5.2.1 Confidence run over complete track

This operational scenario is a normal run over the ERTMS track of multiple ESC types in both directions. The dispatcher sets all routes with normal aspects (NORM). The driver shall react on DMI or trackside signals according to normal operations. The driving speed is the maximum allowed speed. There are no special actions required from both dispatcher and driver. The routes are described in Table 5.2-1 Route settings. The start and end locations area described in Table 5.2-2 Start and end locations. For non-leading engines Table 5.2-8 Scenario steps non-leading engine is applicable during the complete operational scenario.

Id	Location	Route setting
1	Zwijndrecht (Zwd) – Kijfhoek (Kfh)	NORM: Zwd -> 67 -> DA
2	Kijfhoek (Kfh) – Botlek (Bot)	NORM: DA -> DB -> CC -> CD -> CE -> NA -> NB -> NC -> RA -> RB -> RC -> RD -> SE -> RF -> RK
3	Botlek (Bot) – Maasvlakte (Mvt)	NORM: RK -> RO -> RP -> RR -> RT -> Mvt 801-818
4	Maasvlakte (Mvt) – Kijfhoek (Kfh)	NORM: Mvt 810-818 -> PT -> PS -> PR -> PP -> PO -> PL -> PK -> PF -> PE -> PD -> PB -> PA -> MC -> MB -> MA-> Kfh 112-126
5	Kijfhoek (Kfh) – Zwijndrecht (Zwd)	NORM: Kfh 112-126 -> 67 -> HR -> Zwd

Table 5.2-1 Route settings

Id	Location	Start location	End location
1	Zwijndrecht – Kijfhoek	Zwd (not specific)	DA
2	Kijfhoek – Botlek	DA	RK, in rear of infill balise group signal 222 at km 816.800
3	Botlek – Maasvlakte	RK, in rear of infill balise group signal 222 at km 816.800	Mvt (801-818)
4	Maasvlakte – Kijfhoek	Mvt (801-818)	Kfh (112-126)
5	Kijfhoek – Zwijndrecht	Kfh (112 to 126)	Zwd (not specific)

Table 5.2-2 Start and end locations

During the execution of the route, the following steps must be performed.

Step	Action / Control
Pre	• Level is Level NTC-ATB • Mode in SN • Route is set from start location 1 to end location 1
1	Train is running towards transition signal. When receiving the level transition announcement, verify that: a. DMI shows level transition announcement
2	When train front end passes start of level acknowledgement window (not for onboards with B3R2+Art10SP2017), verify that: a. DMI shows level acknowledgement request b. Driver acknowledges level transition within 5 seconds after passing transition location

Step	Action / Control
3	When passing transition signal, verify that: a. DMI shows level change to Level 1 b. DMI shows mode is mode FS c. no brakes applied d. DMI shows no braking (pre)-indication
4	When train is at end location 1, driver continues next scenario

Table 5.2-3 Scenario steps 1

Step	Action / Control
Pre	• Level is Level 1 • Mode in FS • Route is set from start location 2 to end location 2
1	When passing signals, verify that: a. DMI shows level remaining Level 1 b. DMI shows mode remaining mode FS c. no brakes applied
2	When receiving track conditions at voltage change over, verify that a. DMI shows track condition information (announcement, start and end) at the defined locations b. If applicable the train systems show correct behaviour at the defined locations
3	When approaching end of route, verify that a. DMI shows braking curve to EoA
4	When train is stopped at end location 2, driver closes desk

Table 5.2-4 Scenario steps 2

Step	Action / Control
Pre	• Level is Level 1 • Mode in SB • Route is set from start location 3 to end location 3
1	When driver perform Start of Mission procedure, verify that: a. DMI shows level remaining Level 1 b. DMI shows mode change to mode SR
2	When passing infill balise group, verify that a. DMI shows level remaining Level 1 b. DMI shows mode remaining mode SR
3	When passing signal 222, verify that: a. DMI shows level remaining Level 1 b. DMI shows mode change to mode FS c. no brakes applied
4	When passing signals, verify that: a. DMI shows level remaining Level 1 b. DMI shows mode remaining mode FS c. no brakes applied

Step	Action / Control
5	Onboard receives MA towards Mvt with mode profile shunting. When passing start of acknowledgement window mode profile shunting with allowed speed in SH, verify that: a. DMI shows an SH acknowledgement request b. DMI shows braking curve at start of mode profile SH with no release speed c. When driver acknowledges SH acknowledgement request, DMI shows mode change to mode SH
6	When train is stopped at end location 3, driver closes desk.

Table 5.2-5 Scenario steps 3

Step	Action / Control
Pre	• Train direction is changed • Level is Level 1 • Mode in SB • Route is set from start location 4 to end location 4
1	When driver perform Start of Mission procedure, verify that: a. DMI shows level remaining Level 1 b. DMI shows mode change to mode SR
3	When passing signal with balise group, verify that: a. DMI shows level remaining Level 1 b. DMI shows mode change to mode FS c. no brakes applied
4	When passing signals, verify that: a. DMI shows level remaining Level 1 b. DMI shows mode remaining mode FS c. no brakes applied
5	When receiving track conditions at voltage change over, verify that a. DMI shows track condition information (announcement, start and end) at the defined locations b. If applicable the train systems show correct behaviour at the defined locations
6	Onboard receives MA towards Kfh with mode profile shunting. When passing start of acknowledgement window mode profile shunting with allowed speed in SH, verify that: a. DMI shows an SH acknowledgement request b. DMI shows braking curve at start of mode profile SH with no release speed c. When driver acknowledges SH acknowledgement request, DMI shows mode change to mode SH
7	When train is stopped at end location 4, driver performs exit shunting procedure. Verify that: a. DMI shows mode change to mode SB

Table 5.2-6 Scenario steps 4

Step	Action / Control
Pre	• Level is Level 1 • Mode in SB • Route is set from start location 5 to end location 5
1	When driver perform Start of Mission procedure, verify that: a. DMI shows level remaining Level 1 b. DMI shows mode change to mode SR
2	When receiving the connection establishment order from the balise group, verify that: a. DMI shows connection setup with the RBC (only for onboard with B2) b. DMI shows connection establishment with the RBC
3	When receiving the connection termination order from the balise group, verify that: a. DMI shows connection termination with the RBC
4	When passing in opposite direction signal 3220 with balise group, verify that: a. DMI shows level remaining Level 1 b. DMI shows mode change to mode FS c. no brakes applied
5	When receiving level transition order to Level NTC-ATB, verify that: a. DMI shows level transition announcement to Level NTC-ATB
6	When the train front end passes the start of the level transition acknowledgement, verify that: a. DMI show level acknowledgement request b. Driver acknowledges level transition within 5 seconds after passing transition location
7	When passing the level transition location, verify that: a. DMI show level change to Level NTC-ATB b. DMI shows mode change to mode SN
8	When train is stopped at end location 5, driver closes desk

Table 5.2-7 Scenario steps 5

Step	Action / Control
1	When leading engine desk is open, verify that: a. Non-leading cab in mode NL: DMI shows level is according to leading engine (except for distance between engines at transition locations) b. Non-leading cab in mode NL: DMI shows mode is mode NL c. Non-leading cab in mode SL: DMI is in sleeping state

Table 5.2-8 Scenario steps non-leading engine

5.2.2   Exit when failure NTC-ATB
Use scenario in 5.10.1 Exit when failure NTC-ATB. Cross acceptance with other ESC types is not possible.

5.2.3   Running in OS
Use scenario in 5.10.2 Entering OS. Cross acceptance with other ESC types is not possible.

5.2.4   Entrance specialties from ATB to ERTMS
This operational scenario contains special entrance scenarios. Figure 5.2-1 Entrance situation shows the situations of the entrance as used. The train starts in rear of signal 102 (or one or more signals before to start before the first balise group). The dispatcher sets all routes according to Table 5.2-9

Route settings[3]. After all routes are set, the train runs the route following the signals and DMI information. The driver has to operate according the operational rules applicable for the situation. The route setting ends at signal 204.

On the transition to overlay tracks Kijfhoek the CAB sign is not present. The CAB sign is only present at the transition to Havenspoorlijn (non-overlay area).

The entry is controlled by several balises. Balise BGA announces the transition and gives a track description for the sections in rear of the transition to prevent the "entry in FS/OS" message. Balise BGB provides the MA for the ERTMS area.
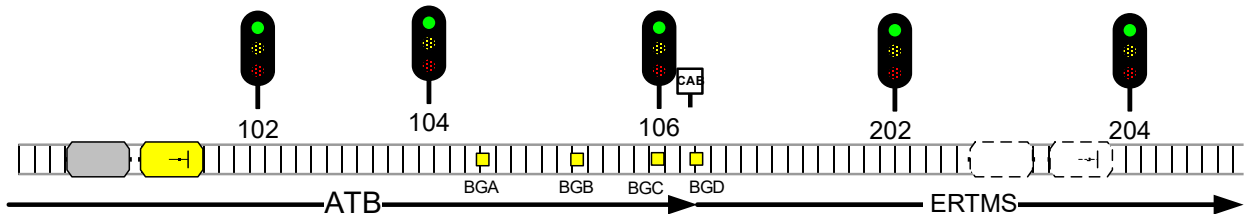
Figure 5.2-1 Entrance situation

Note: balise group BGA is not placed when going only to a ERTMS shunting area. Balise BGD is not placed when signal 106 cannot be set with ROZ route.

Scenario	Description	102	104	106	202
2.4a	NORM-ROZ	NORM	NORM	ROZ	ROZ
2.4b	ROZ-NORM	NORM	ROZ	NORM	NORM
2.4c	STS-NORM	NORM	NORM	STOP	NORM
2.4d	To Yard NORM	NORM	NORM	NORM	Yard
2.4e	To Yard ROZ	NORM	NORM	ROZ	Yard
2.4f	To yard STS	NORM	NORM	STOP	Yard

Table 5.2-9 Route settings

Scenario	Description	102	104	106	202
2.4a	NORM-ROZ	SN/ATB	SN/ATB	OS	OS
2.4b	ROZ-NORM	SN/ATB	SN/ATB	FS	FS
2.4c	STS-NORM	SN/ATB	SN/ATB	TR	FS
2.4d	To yard NORM	SN/ATB	SN/ATB	SN/ATB	SH
2.4e	To yard ROZ	SN/ATB	SN/ATB	SN/ATB	SH
2.4f	To yard STS	SN/ATB	SN/ATB	TR	SH

Table 5.2-10 Mode after passing signal

The scenarios 2.4d, 2.4e and 2.4f are special cases on Kijfhoek when a train drives from ATB area directly into the yard (ERTMS shunting area).

For each scenario the following steps must be performed.

Step	Action / Control
Pre	• level is Level NTC-ATB • mode is SN • route is set according to Table 5.3-2

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[3] Unless a signal is a P-sein and will automatically switch to yellow or green if the track is not occupied.

ETCS System Compatibility (ESC)

Step	Action / Control
1	When passing signal 102, verify that: a. DMI shows correct ATB code
2	When passing signal 104, verify that: a. DMI shows correct ATB code
3	When receiving the level transition announcement (not scenario 2.4c and 2.4f), verify that: a. DMI shows level transition announcement
4	When train front end passes start of level acknowledgement window (not scenario 2.4c and 2.4f) (not onboard with B3R2+Art10SP2017), verify that: a. DMI shows level acknowledgement request b. Driver acknowledges level transition within 5 seconds after passing transition location
5a	When passing signal 106 (not scenario 2.4c and 2.4f), verify that: a. DMI shows level change to Level 1 b. DMI shows mode according to Table 5.2-10 c. DMI shows no ATB code
5b	Only scenario 2.4c: When passing signal 106, verify that: a. DMI shows level change to Level 1 b. Brakes are applied c. DMI shows mode TR[4] d. Driver acknowledges PT mode and request start and runs in SR
5c	Only scenario 2.4f: When passing signal 106, verify that: a. DMI shows level change to Level 1 b. Brakes are applied c. DMI shows mode TR d. Driver acknowledges PT mode and request SH
6a	Only scenario 2.4a: Verify that: a. DMI shows an OS acknowledgement request b. Driver acknowledges OS acknowledgement request
6b	Only scenario 2.4d, 2.4e and 2.4f: Verify that: a. DMI shows an SH acknowledgement request b. Driver acknowledges SH acknowledgement request
7	When passing signal 202, verify that: a. DMI shows level is Level 1 b. DMI shows mode according to Table 5.2-10 c. DMI shows movement authority ending at or in advance of signal 204
8	When receiving National Values for braking curves, verify that: a. for non-System Version 1.1 compatible onboards National Values for braking curves is discarded; other information of the balise groups shall be considered b. for System Version 1.1 compatible onboards: all information of the balise groups shall be considered and the braking characteristics updated

Table 5.2-11 Scenario steps

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[4] If ATB-Vv beacons are placed at the signal: when the onboard is not already switched to TR, a brake invention will be triggered while passing the ATB-Vv beacons.

5.2.5 Exit specialties to ATB

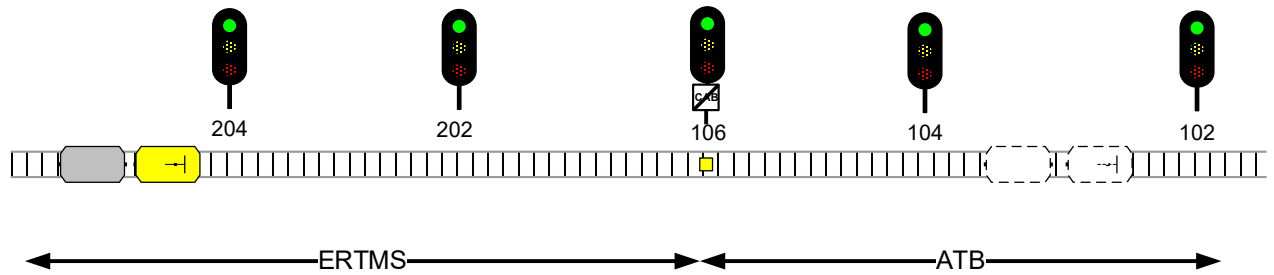This operational scenario contains all special exit scenarios.

Figure 5.2-2 Exit situation

Figure 5.2-2 Exit situation shows the situation of the exit. The train starts in rear of signal 204. The Dispatcher sets all routes according Table 5.2-12 Route settings. After all routes are set, the train runs the route following the signals and DMI information. The driver has to operate according the operational rules applicable for the situation.

Note that on the overlay track Kijfhoek the CAB and END-CAB signs are not present.

Scenario	Description	204	202	106	104
2.5a	NORM-ROZ	NORM	NORM	ROZ	NORM
2.5b	ROZ-NORM	NORM	ROZ	NORM	NORM
2.5c	ROZ-ROZ	NORM	ROZ	ROZ	NORM
2.5d	STS-NORM	NORM	NORM	STOP	NORM

Table 5.2-12 Route settings

Scenario	Description	204	202	106	104
2.5a	NORM-ROZ	FS	FS	SN/ATB	SN/ATB
2.5b	ROZ-NORM	FS	OS	SN/ATB	SN/ATB
2.5c	ROZ-ROZ	FS	OS	SN/ATB	SN/ATB
2.5d	STS-NORM	FS	FS	SN/ATB	SN/ATB

Table 5.2-13 Mode after passing signal

For each scenario the following steps must be performed.

Step	Action / Control
Pre	• level is Level 1 • mode is according to Table 5.2-13 • route is set according Table 5.2-12.
1	When passing signal 204, verify that: a. DMI shows mode according to Table 5.2-13.
2	Only scenario 2.5b and 2.5c: Before passing signal 202, verify that: a. DMI shows braking curve ending at signal 202 with no release speed b. DMI shows an OS acknowledgement request c. When driver acknowledge OS acknowledgement, DMI shows MA extension to signal 106 and mode is mode OS
3	When passing signal 202, verify that: a. DMI shows mode according to Table 5.2-13

ETCS System Compatibility (ESC)

Step	Action / Control
4	Before passing signal 106 (not scenario 2.5d), verify that: a. DMI shows announcement level transition to Level NTC-ATB[5]
5	When train front end passes start of level acknowledgement window (not scenario 2.5d), verify that: a. DMI shows level acknowledgement request b. Driver acknowledges level transition within 5 seconds after passing transition location
6a	After passing signal 106 (not scenario 2.5d), verify that: a. DMI shows level change to Level NTC-ATB b. DMI shows mode change to mode SN[6] c. DMI shows correct ATB code
6b	Only scenario 2.5d: When passing signal 106, verify that: a. DMI shows level change to Level NTC-ATB b. DMI shows mode change to mode TR c. brakes are applied d. when driver acknowledge the Trip, DMI shows mode change to mode SN e. DMI shows level acknowledgement request f. Driver acknowledges level transition
7	When passing signal 104, verify that: a. DMI shows correct ATB code

Table 5.2-14 Scenario steps

5.2.6   Mode Transition to Shunting (for NORM or ROZ route)

This scenario verifies the behaviour of the train for the several types of mode transitions that occurs when driving from the mainline to the yard (Shunting area).

The scenarios 2.6a to 2.6d and 2.6h deal with locations where the transition to mode SH takes place at the signal.

Typical for these scenarios is that shunting is announced sufficient in advance to avoid braking due to no release speed at start of the mode profile. The driver shall get the acknowledgement request in rear of the signal and the train is forced into mode SH directly after passing the signal. For scenario 2.6e to 2.6g the principle is the same, only the transition does not take place at a signal but in the middle of a route; a speed sign is placed at that location. The transition takes place when leaving the main track, currently one location at Kijfhoek when leaving the Sophia tunnel running to the yard.

The test must be performed with all the brake parameters and characteristics the train may have when it is used in operation with maximum length and weight and minimum brake force.

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[5] Situations can occur where an already announced level transition is repeated from the trackside. The reception of this repeated level transition order may not interfere with the announced level transition order in the case that the contents are similar.

[6] For scenario 2.5b depending on the level transition location and the train confidence interval the DMI shows shortly mode change to mode FS before mode change to SN
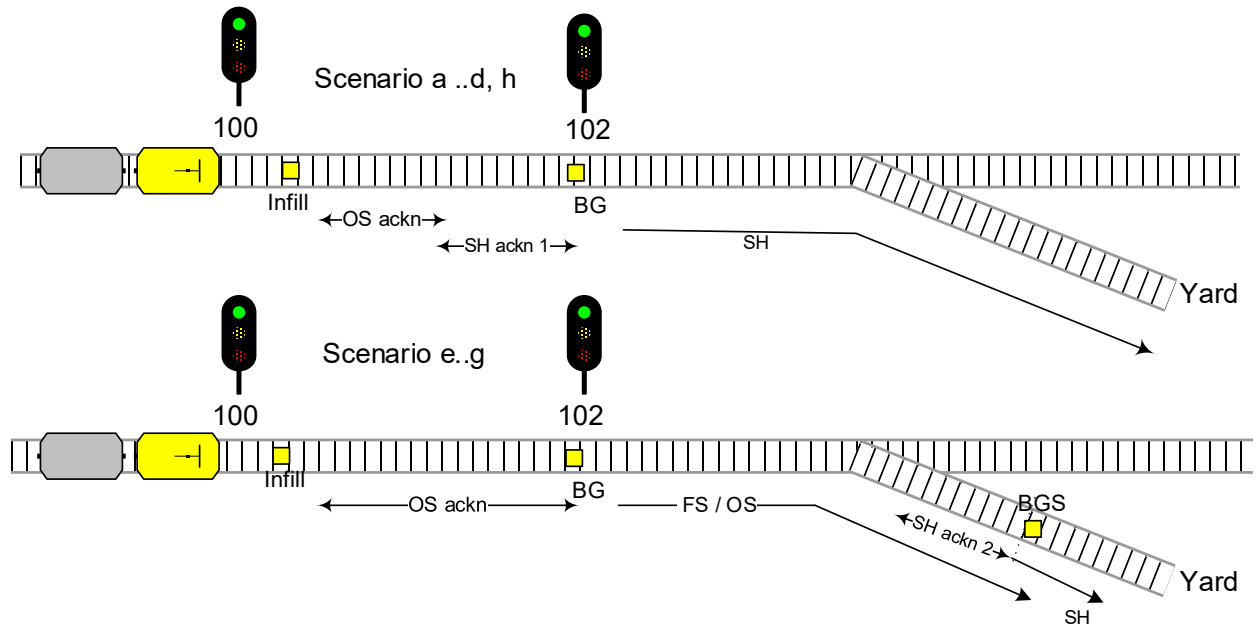
Figure 5.2-3 Situations

Scenario	Description	100	102
2.6a	Normal route	NORM	NORM
2.6b	ROZ route	NORM	ROZ
2.6c	ROZ-ROZ route	ROZ	ROZ
2.6d	Normal route (acknowledgment of SH after passing the start of the SH area)	NORM	NORM
2.6e	Normal route	NORM	NORM
2.6f	ROZ route	NORM	ROZ
2.6g	ROZ route (acknowledgment of SH after passing the start of the SH area)	NORM	ROZ
2.6h	ROZ route (no acknowledgment of OS)	NORM	ROZ

Table 5.2-15 Route settings

Scenario	Description	Passes infill in	OS ackn	SH ackn 1	Passes 102 in	SH ackn 2
2.6a	Normal route	FS	N/A	SH	SH	N/A
2.6b	ROZ route	FS	OS	SH	SH	N/A
2.6c	ROZ-ROZ route	OS	N/A	N/A	SH	N/A
2.6d	Normal route (acknowledgment of SH after passing the start of the SH area)	FS	N/A	N/A	SH	N/A
2.6e	Normal route	FS	N/A	N/A	FS	SH
2.6f	ROZ route	FS	OS	N/A	OS	SH

ETCS System Compatibility (ESC)

Scenario	Description	Passes infill in	OS ackn	SH ackn 1	Passes 102 in	SH ackn 2
2.6g	ROZ route (acknowledgment of SH after passing the start of the SH area)	FS	OS	N/A	OS	SH
2.6h	ROZ route (no acknowledgment of OS)	FS	OS	N/A	SH	N/A

Table 5.2-16 Test scenarios

For each scenario the following steps must be performed.

Step	Action / Control
Pre	• Level is Level 1 • Mode is mode FS • Route is set according to Table 5.2-15
1a	Only scenarios 2.6b, 2.6f and 2.6g: When passing start of *OS ackn* in rear of signal 102, verify that: a. Start of *OS ackn* can be reached with 40 km/h or a reasonable speed b. DMI shows an OS acknowledgement request c. DMI shows braking curve at signal 102 with no release speed d. When driver acknowledge OS acknowledgement request, DMI shows MA extension in advance of signal 102
1b	Only scenario 2.6h: When passing start of *OS ackn* in rear of signal 102, verify that: a. Start of *OS ackn* can be reached with 40 km/h or a reasonable speed b. DMI shows an OS acknowledgement request c. DMI shows braking curve at signal 102 with no release speed d. Drives does not acknowledge OS acknowledgement request
2a	Only scenarios 2.6a, 2.6b and 2.6d: When passing start of *SH ackn 1* in rear of signal 102, verify that: a. Start of *SH ackn 1* can be reached with 40 km/h or a reasonable speed b. DMI shows an SH acknowledgement request c. DMI shows braking curve at a location ~750m in advance of the signal 102 with no release speed d. no brake intervention
2b	Only scenario 2.6h: When passing start of *SH ackn 1* in rear of signal 102, verify that: a. DMI remains to show an OS acknowledgement request b. DMI shows braking curve at signal 102 with no release speed c. When driver acknowledge OS acknowledgement request, DMI shows MA extension in advance of signal 102
3	Only scenario 2.6h: Verify that: a. DMI shows an SH acknowledgement request b. DMI shows braking curve at a location ~750m in advance of the signal 102 with no release speed c. no brake intervention
4	Only scenarios 2.6a, 2.6b and 2.6h: Before passing signal 102, verify that: a. When driver acknowledges SH acknowledgement request, DMI shows mode change to mode SH

Step	Action / Control
5a	Only scenarios 2.6c and 2.6d: When passing signal 102, verify that: a. DMI shows mode change to mode SH b. DMI shows an SH acknowledgement request c. Driver acknowledges SH acknowledgement request within 5 seconds after mode change
5b	Only scenarios 2.6e, 2.6f and 2.6g: When passing signal 102, verify that: a. DMI shows mode according to Table 5.2-14
6	Only scenarios 2.6e, 2.6f and 2.6g: When passing start of *SH ackn 2*-window, verify that the: a. Start of *SH ackn 2* can be reached with 40 km/h or a reasonable speed b. DMI shows an SH acknowledgement request
7a	Only scenarios 2.6e and 2.6f: Before passing balise BGS, verify that a. When driver acknowledges SH acknowledgement request, DMI shows mode change to mode SH
7b	Only scenario 2.7g: When passing balise BGS, verify that a. DMI shows mode change to mode SH b. DMI shows an SH acknowledgement request c. Driver acknowledges SH acknowledgement request within 5 seconds after mode change

Table 5.2-17 Scenario Steps

5.2.7 Signal passed at danger

Use scenario in 5.10.5 Signal passed at danger. Cross acceptance with other ESC types is not possible.

5.3   ERTMS track Kijfhoek – BetuweRoute

5.3.1   Transition Level 1 -> Level 2: Late connection

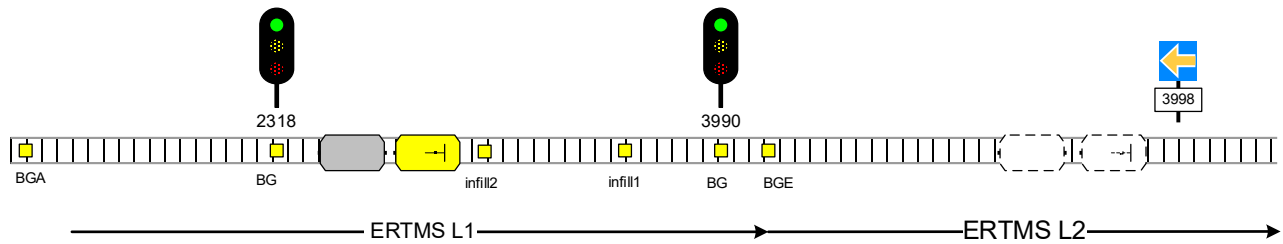This operational scenario is a special scenario of the transition from Level 1 to Level 2.

Figure 5.3-1 Transition Level 1 -> Level 2

Description	2318	3990	3998
FS-FS Late connection	NORM	NORM	NORM

Table 5.3-1 Route setting

This scenario tests the behaviour when a train makes the transition when the connection with the RBC is not set up and at a later moment when the train is in the Level 2 area the connection is established. This scenario has a route setting according Table 5.3-1 and has to follow the steps as defined in Table 5.3-2.

The following steps must be performed.

Step	Action / Control
Pre	• level is Level 1 • mode is mode FS • train is in rear of infill2 • route signal 2318 in set according to Table 5.3-1 • modem is registered on applicable radio network • modem has no connection with RBC
1	Route signal 3990 in set according to Table 5.3-1
2	When passing BG infill2, verify that: a. DMI shows MA extension till signal 3998
3	When passing signal 3990, verify that: a. DMI shows connection setup with the RBC (only for onboard with B2)
4	When passing BGE, verify that: a. DMI shows level change to Level 2
5	After passing signal 3990 and before communication session is established, route signal 3998 in set according to Table 5.3-1
6	When the communication is established, verify that: a. DMI shows MA extension in advance of signal 3998

Table 5.3-2 Scenario steps

5.4   ERTMS track BetuweRoute – Zevenaar Oost

5.4.1   Confidence run over complete track

This operational scenario is a normal run over the ERTMS track of multiple ESC types in both directions. The dispatcher sets all routes with normal aspects (NORM). The driver shall react on DMI or trackside signals according to normal operations. The driving speed is the maximum allowed speed. There are no special actions required from both dispatcher and driver. The locations of the route are described in Table 5.4-1 Route settings. The start and end locations area described in Table 5.4-2 Start and end locations. For non-leading engines Table 5.4-10 Scenario steps non-leading engine is applicable during the complete operational scenario.

Id	Route	Route setting
1	Kijfhoek (Kfh) – Papendrecht (Brppd)	NORM: Kfh -> ZAn -> ZB1
2	Papendrecht (Brppd) – Zevenaar-Oost (Zvo)	NORM: ZB1 -> ZCn -> ZDn -> 523 -> ZEn -> ZFn -> ZGn -> ZJn -> ZLn -> 813
3	Zevenaar-Oost (Zvo) – Emmerich (Emm)	NORM: 813 -> 822 -> FZ -> Emm
4	Emmerich (Emm) – Zevenaar-Oost (Zvo)	NORM: Emm -> EZ -> 821 -> 814-815
5	Zevenaar-Oost (Zvo) – Valburg CUP (Brcup)	NORM: 814- 815 -> KLn -> KJn -> -> 564 -> 731-733
6	Valburg CUP (Brcup) – Papendrecht (Brppd)	NORM: 731-733 -> KGn -> KFn ->KEn -> 521 -> KDn -> KCn -> KB1
7	Papendrecht (Brppd) – Kijfhoek (Kfh)	NORM: KB1 -> KA -> IA

Table 5.4-1 Route settings

Id	Location	Start location	End location
1	Kijfhoek (Kfh) – Papendrecht (Brppd)	Kfh (not specific)	ZB1
2	Papendrecht (Brppd) – Zevenaar-Oost (Zvo)	ZB1	813
3	Zevenaar-Oost (Zvo) – Emmerich (Emm)	813	Emm (not specific)
4	Emmerich (Emm) – Zevenaar-Oost (Zvo)	Emm (not specific)	814-815
5	Zevenaar-Oost (Zvo) – Valburg CUP (Brcup)	814-815	731-733
6	Valburg CUP (Brcup) – Papendrecht (Brppd)	731-733	KB1
7	Papendrecht (Brppd) – Kijfhoek (Kfh)	KB1	IA

Table 5.4-2 Start and end locations

During the execution of the route, the following steps must be performed.

Step	Action / Control
Pre	• Level is Level 1 • Mode in SB • Route is set from start location 1 to end location 1

ETCS System Compatibility (ESC)

Step	Action / Control
1	When driver perform Start of Mission procedure, verify that: a. DMI shows level remaining Level 1 b. DMI shows mode change to mode SR
2	When passing signal with balise group, verify that: a. DMI shows level remaining Level 1 b. DMI shows mode change to mode FS c. no brakes applied
3	When receiving the connection establishment order from the balise group, verify that: a. DMI shows connection setup with the RBC (only for onboard with B2)
4	Train is running towards transition signal. When receiving the level transition announcement, verify that: a. DMI shows level transition announcement b. DMI shows connection establishment with the RBC
5	When passing transition signal, verify that: a. DMI shows level change to Level 2 b. DMI shows mode remaining mode FS c. no brakes applied
6	When receiving track conditions at voltage change over, verify that a. DMI shows track condition information (announcement, start and end) at the defined locations b. If applicable the train systems show correct behaviour at the defined locations
7	When train is at end location 1, driver continues next scenario

Table 5.4-3 Scenario steps 1

Step	Action / Control
Pre	• Level is Level 2 • Mode in FS • Route is set from start location 2 to end location 2
1	When passing signal, verify that: a. DMI shows level remaining Level 2 b. DMI shows mode remaining mode FS c. no brakes applied
2	When receiving track conditions at phase lock, verify that: a. DMI shows track condition information (announcement, start and end) at the defined locations b. If applicable the train systems show correct behaviour at the defined locations
3	When receiving RBC transition order, verify that: a. DMI shows connection establishment with (handing over[7]) RBC b. When train front end passes RBC transition location, DMI shows connection establishment with (accepting) RBC c. no brakes applied
4	When train is at end location 2, driver continues next scenario

Table 5.4-4 Scenario steps 2

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[7] DMI shows only one connection without information to which RBC the connection is established. Some B2 DMI could show 2 connections.

Step	Action / Control
Pre	• Level is Level 2 • Mode in FS • Route is set from start location 3 to end location 3
1	When receiving level transition order to Level NTC-PZB, verify that: a. DMI shows level transition announcement to Level NTC-PZB
2	When the train front end passes the start of the level transition acknowledgement, verify that: a. DMI show level acknowledgement request b. Driver acknowledges level transition within 5 seconds after passing transition location
3	When passing the level transition location, verify that: a. DMI show level change to Level NTC-PZB b. DMI shows mode change to mode SN
4	When train is stopped at end location 3, driver closes desk

Table 5.4-5 Scenario steps 3

Step	Action / Control
Pre	• Train direction is changed • Level is Level NTC-PZB • Mode in SN • Route is set from start location 4 to end location 4
1	When receiving the connection establishment order from the balise group, verify that: a. DMI shows connection setup with the RBC (only for onboard with B2)
2	Train is running towards transition signal. When receiving the level transition announcement, verify that: a. DMI shows level transition announcement b. DMI shows connection establishment with the RBC
3	When train front end passes start of level acknowledgement window (not for onboards with B3R2+Art10SP2017), verify that: a. DMI shows level acknowledgement request b. Driver acknowledges level transition within 5 seconds after passing transition location
4	When passing transition signal, verify that: a. DMI shows level change to Level 2 b. DMI shows mode change to mode FS c. no brakes applied d. DMI shows no braking (pre)-indication
5	When train is at end location 4, driver continues next scenario

Table 5.4-6 Scenario steps 4

Step	Action / Control
Pre	• Level is Level 2 • Mode in FS • Route is set from start location 5 to end location 5

Step	Action / Control
1	When passing signals, verify that: a. DMI shows level remaining Level 2 b. DMI shows mode remaining mode FS c. no brakes applied
2	When approaching end of route, verify that a. DMI shows braking curve to EoA
3	When train is stopped at end location 5, driver closes desk

Table 5.4-7 Scenario steps 5

Step	Action / Control
Pre	• Level is Level 2 • Mode in SB • Route is set from start location 6 to end location 6
1	When driver perform Start of Mission procedure, verify that: a. DMI shows level remaining Level 2 b. DMI shows mode change to mode OS c. DMI shows OS acknowledgement request d. Driver acknowledges OS acknowledgement request
2	When passing signal with balise group, verify that: a. DMI shows level remaining Level 2 b. DMI shows mode change to mode FS c. no brakes applied
3	When passing signals, verify that: a. DMI shows level remaining Level 2 b. DMI shows mode remaining mode FS c. no brakes applied
4	When receiving track conditions at phase lock, verify that a. DMI shows track condition information (announcement, start and end) at the defined locations b. If applicable the train systems show correct behaviour at the defined locations
5	When receiving RBC transition order, verify that: a. DMI shows connection establishment with (handing over[8]) RBC b. When train front end passes RBC transition location, DMI shows connection establishment with (accepting) RBC c. no brakes applied
6	When train is at end location 6, driver continues next scenario

Table 5.4-8 Scenario steps 6

Step	Action / Control
Pre	• Level is Level 2 • Mode in FS • Route is set from start location 7 to end location 7

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[8] DMI shows only one connection without information to which RBC the connection is established. Some B2 DMI could show 2 connections.

Step	Action / Control
1	When receiving track conditions at voltage change over, verify that a. DMI shows track condition information (announcement, start and end) at the defined locations b. If applicable the train systems show correct behaviour at the defined locations
2	When receiving level transition order to Level 1, verify that: a. DMI shows level transition announcement to Level 1
3	When passing the level transition location, verify that: a. DMI show level change to Level 1 b. DMI shows mode remaining mode FS c. no brakes applied
4	When train is stopped at end location 7, driver closes desk

Table 5.4-9 Scenario steps 7

Step	Action / Control
1	When leading engine desk is open, verify that: a. Non-leading cab in mode NL: DMI shows level is according to leading engine (except for distance between engines at transition locations) b. Non-leading cab in mode NL: DMI shows mode is mode NL c. Non-leading cab in mode SL: DMI is in sleeping state

Table 5.4-10 Scenario steps non-leading engine

5.4.2 Exit when failure NTC-ATB

Use scenario in 5.10.1 Exit when failure NTC-ATB. Cross acceptance with other ESC types is not possible.

5.4.3 Running in OS

Use scenario in 5.10.2 Entering OS. Cross acceptance with other ESC types is not possible.

5.4.4 Entrance specialties from ATB to ERTMS

This operational scenario contains special entrance scenarios. Figure 5.4-1 shows the situations of the entrances as used. The train starts in rear of signal 102 (or one or more signals before to start before the first balise group). The dispatcher sets all routes according to Table 5.4-11. Note that the signal 106 could be a virtual signal[9] on some tracksides. After all routes are set, the train runs the route following the signals and DMI information. The driver has to operate according the operational rules applicable for the situation. The route setting ends at signal 204.

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[9] Signal is not controlled by traffic control center and placed at the track

Figure 5.4-1 Entrance situations
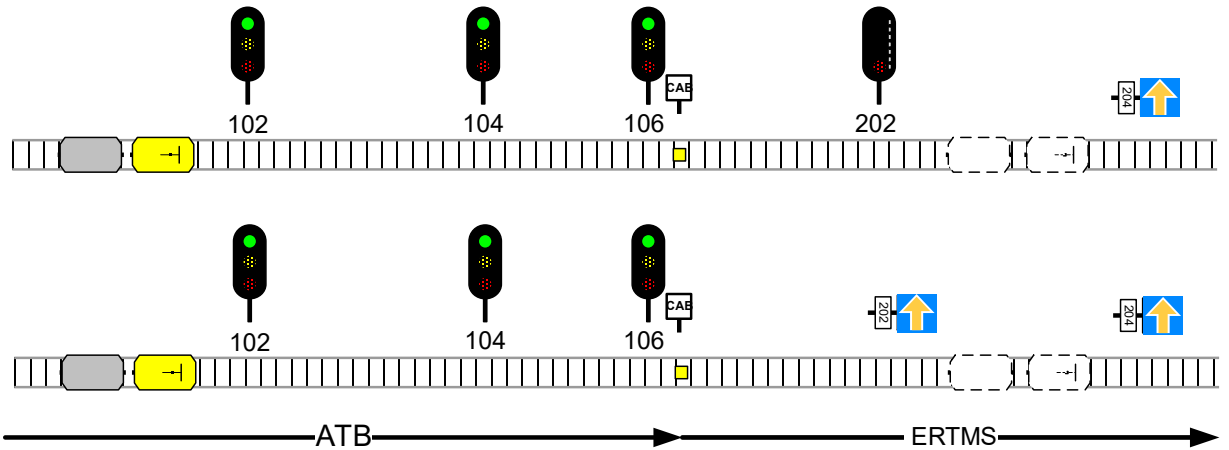
Scenario	Description	102	104	106	202
4.4a	ROZ-NORM	NORM	ROZ	NORM	NORM
4.4b	ROZ-ROZ	NORM	ROZ	ROZ	ROZ
4.4c	STS-NORM	NORM	NORM	STOP	NORM
4.4d	Radio failure / Section timer expiration	NORM	NORM	NORM	NORM

Table 5.4-11 Route settings

Scenario	Description	102	104	106	202
4.4a	ROZ-NORM	SN/ATB	SN/ATB	FS	FS
4.4b	ROZ-ROZ	SN/ATB	SN/ATB	OS	OS
4.4c	STS-NORM	SN/ATB	SN/ATB	TR	FS
4.4d	Radio Failure/ Section timer expiration	SN/ATB	SN/ATB	TR	SR

Table 5.4-12 Mode after passing signal

Scenario 4.4b is only possible at Zevenaar entrance, Meteren entrance via EE and FF track, Elst entrance via GG, HH and KK track. At other entrances in Meteren and Elst, this route setting will result in a train trip at signal 106 as no MA will be sent.

Scenario 4.4d is a special scenario for BetuweRoute tracks about radio failure before entering inside the Level 2 area leading to the expiration of section timer and the train trip at the border. In this scenario the entry routes are set, but the train does not enter immediately inside the Level 2 area. The radio connection is lost after the reception of the entrance MA message, then the section timer part of the MA message expires, and the MA is shortened onboard at the border leading to a train trip when crossing signal 106.

For each scenario the following steps must be performed.

Step	Action / Control
Pre	• level is Level NTC-ATB • mode is SN • route is set according to Table 5.4-11.

Step	Action / Control
1	When receiving the connection establishment order from the balise group, verify that: a. DMI shows connection setup with the RBC (only for onboard with B2)
2	When passing signal 102, verify that: a. DMI shows correct ATB code
3	When passing signal 104, verify that: a. DMI shows correct ATB code
4	When receiving the level transition announcement, verify that: a. DMI shows level transition announcement b. DMI shows connection establishment with the RBC
5	When train front end passes start of level acknowledgement window (not for onboards with B3R2+Art10SP2017), verify that: a. DMI shows level acknowledgement request b. Driver acknowledges level transition within 5 seconds after passing transition location
6	Only scenario 4.4d: Train stops before signal 106 and radio connection fails. When connection to the RBC is lost, verify that: a. DMI shows connection lost with the RBC
7a	When passing signal 106 (not scenario 4.4c and 4.4d), verify that: a. DMI shows level change to Level 2 b. DMI shows mode according to Table 5.4-12 c. DMI shows no ATB code
7b	Only scenario 4.4c: When passing signal 106, verify that: a. DMI shows level change to Level 2 b. DMI shows mode change to mode TR[10] c. Driver acknowledges PT mode and request start and runs in SR/OS
7c	Only scenario 4.4d: Wait more than 130s seconds at standstill to expire section timer. When passing signal 106 after the section timer expired not passing the Section Time Out Stop Location, verify that: a. DMI shows level change to Level 2 b. DMI shows mode change to mode TR c. Driver acknowledges PT mode and request start and runs in SR/OS
8a	Only scenario 4.4b: Verify that: a. DMI shows an OS acknowledgement request b. DMI shows MA ending at signal 202
9	Only scenario 4.4b: Before passing signal 202, verify that: a. DMI shows no OS acknowledgement request
10	When passing signal 202, verify that: a. DMI shows level is Level 2 b. DMI shows mode according to Table 5.4-12 c. DMI shows movement authority ending at or in advance of signal 204
12	When receiving National Values for braking curves, verify that: a. for non-System Version 1.1 compatible onboards National Values for braking curves is discarded; other information of the balise groups shall be considered b. for System Version 1.1 compatible onboards: all information of the balise groups shall be considered and the braking characteristics updated

Table 5.4-13 Scenario steps

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[10] If ATB-Vv beacons are placed at the signal: when the onboard is not already switched to TR, a brake invention will be triggered while passing the ATB-Vv beacons.

5.4.5   Exit specialties to ATB

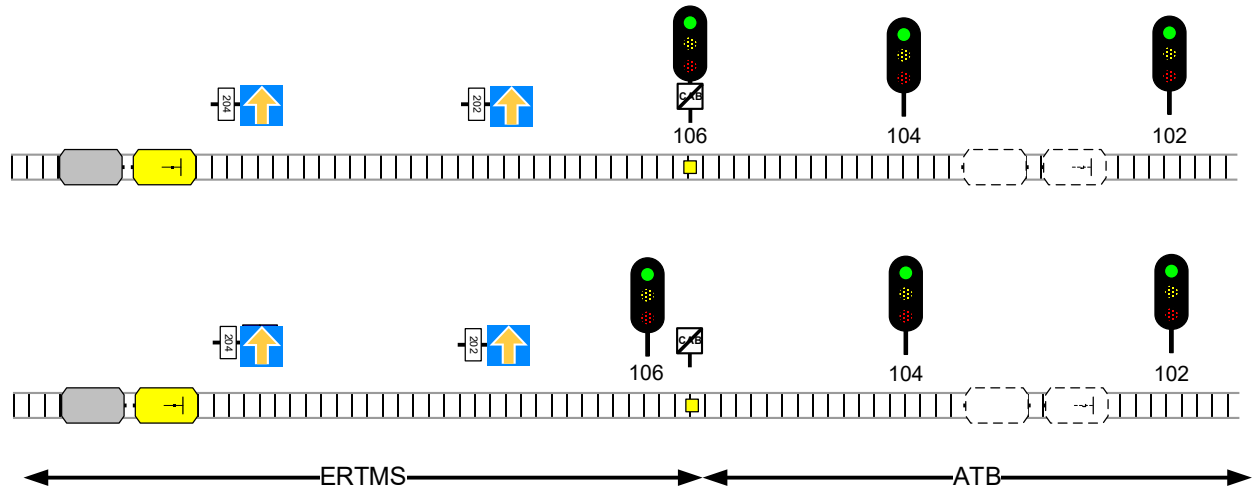This operational scenario contains special exit scenarios.

Figure 5.4-2 Exit situations

Figure 5.4-2 shows the situations of the exits as used. The train starts in rear of signal 204. The Dispatcher sets all routes according Table 5.4-14. After all routes are set, the train runs the route following the signals and DMI information. The driver has to operate according the operational rules applicable for the situation.

Scenario	Description	204	202	106	104
4.5a	NORM-ROZ	NORM	NORM	ROZ	NORM
4.5b	ROZ-NORM	NORM	ROZ	NORM	NORM
4.5c	ROZ-ROZ	NORM	ROZ	ROZ	NORM
4.5d	STS-NORM	NORM	NORM	STOP	NORM

Table 5.4-14 Route settings

Scenario	Description	204	202	106	104
4.5a	NORM-ROZ	FS	FS	SN/ATB	SN/ATB
4.5b	ROZ-NORM	FS	OS	SN/ATB	SN/ATB
4.5c	ROZ-ROZ	FS	OS	SN/ATB	SN/ATB
4.5d	STS-NORM	FS	FS	SN/ATB	SN/ATB

Table 5.4-15 Mode after passing signal

For each scenario the following steps must be performed.

Step	Action / Control
Pre	• level is Level 2 • mode is according Table 5.4-15 • route is set according Table 5.4-14.
1	When passing signal 204, verify that: a. DMI shows mode according to Table 5.4-15.
2	Only scenario 4.5b and 4.5c: Before passing signal 202, verify that: a. DMI shows braking curve ending at signal 202 with no release speed b. DMI shows an OS acknowledgement request c. when driver acknowledge OS acknowledgement, DMI shows MA extension to signal 106

Step	Action / Control
3	When passing signal 202, verify that: a. DMI shows mode according to Table 5.4-15
4	Before passing signal 106 (not scenario 4.5d), verify that: a. DMI shows announcement level transition to Level NTC-ATB[11]
5	When train front end passes start of level acknowledgement window (not scenario 4.5d), verify that: a. DMI shows level acknowledgement request b. driver acknowledges level transition within 5 seconds after passing transition location
6a	When passing signal 106 (not scenario 4.5d), verify that: a. DMI shows level change to Level NTC-ATB b. DMI shows mode change to mode SN[12] c. DMI shows correct ATB code
6b	Only scenario 4.5d: When passing signal 106, verify that: a. DMI shows level change to Level NTC-ATB b. DMI shows mode change to mode TR c. brakes are applied d. when driver acknowledge the Trip, DMI shows mode change to mode SN e. driver acknowledges level transition
7	When the connection termination order is received, verify that: a. DMI shows termination of the RBC connection
8	After passing signal 104, verify that: a. DMI shows correct ATB code

Table 5.4-16 Scenario steps

5.4.6   Movement revocation
Use scenario in 5.10.3 Movement revocation. Cross acceptance with other ESC types is not possible.

5.4.7   Override (STS passage)
Use scenario in 5.10.4 Override (STS passage). Cross acceptance with other ESC types is not possible.

5.4.8   Signal passed at danger
Use scenario in 5.10.5 Signal passed at danger. Cross acceptance with other ESC types is not possible.

5.4.9   Change direction
Use scenario in 5.10.6 Change direction. Cross acceptance with other ESC types is not possible.

5.4.10   RBC Handover with one active modem
This scenario verifies the behaviour of the onboard in the event of an RBC Handover with only one active modem. For onboards equipped with multiple modems, for this scenario the system must be configured in the sense that only one modem is active.

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[11] Situations can occur where an already announced level transition is repeated from the trackside. The reception of this repeated level transition order may not interfere with the announced level transition order in the case that the contents are similar.
[12] For scenario 4.5b depending on the level transition location and the train confidence interval the DMI shows shortly mode change to mode FS before mode change to SN

While the onboard is still connected to the handing over RBC, there are no possibilities to contact the accepting RBC. Once the session with the handing over RBC is terminated, the onboard shall connect with the accepting RBC. The time interval between the termination of the session with the handing over RBC and the successful session establishment of the accepting RBC is a good performance indication. This connection attempt must be successful within T_NVCONTACT.

The following steps must be performed.

Step	Action / Control
Pre	• level is Level 2 • train is connected with handing over RBC • train length is the maximum allowed train length • Routes are set from handing over RBC into accepting RBC with NORM
1	Train is running[13] from handing over RBC to accepting RBC
2	When the onboard receives an RBC Transition order announcement, verify that: a. DMI shows connection establishment with (handing over[14]) RBC
3	When the train front end passes the RBC-RBC border, verify that: a. DMI shows connection establishment with (handing over) RBC
4	When the train rear end passes the RBC-RBC border, verify that: a. DMI shows connection termination with (handing over) RBC
5	When connection with (handing over) RBC is terminated, verify that: a. DMI shows connection establishment with (accepting) RBC within T_NVCONTACT b. no brakes applied due M_NVCONTACT reaction

Table 5.4-17: Scenario Steps

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[13] During the handover the minimum speed sof the train shall be 40 km/h to avoid a movement revocation due to time out of the RBC handover.
[14] DMI shows only one connection without information to which RBC the connection is established

5.5 ERTMS Track Zevenaar Oost – border Germany

5.5.1 Confidence run over complete track

This operational scenario is a normal run over the ERTMS track of multiple ESC types in both directions. The dispatcher sets all routes with normal aspects (NORM). The driver shall react on DMI or trackside signals according to normal operations. The driving speed is the maximum allowed speed. There are no special actions required from both dispatcher and driver. The locations of the route are described in Table 5.5-1 Route settings. The start and end locations area described in Table 5.5-2 Start and end locations. For non-leading engines Table 5.5-7 Scenario steps non-leading engine is applicable during the complete operational scenario.

Id	Route	Route setting
1	Arnhem (Ah) – Zevenaar-Oost (Zvo)	NORM: Ah -> 904 -> 810 -> 814
2	Zevenaar-Oost (Zvo) – Emmerich (Emm)	NORM: 814 -> 822 -> FZ -> Emm
3	Emmerich (Emm) – Zevenaar-Oost (Zvo)	NORM: Emm -> EZ -> 821 -> 815
4	Zevenaar-Oost (Zvo) – Arnhem (Ah) –	NORM: 815 -> 809 -> 902 -> Ah

Table 5.5-1 Route settings

Id	Location	Start location	End location
1	Arnhem (Ah) – Zevenaar-Oost (Zvo)	Ah (not specific)	814
2	Zevenaar-Oost (Zvo) – Emmerich (Emm)	814	Emm (not specific)
3	Emmerich (Emm) – Zevenaar-Oost (Zvo)	Emm (not specific)	815
4	Zevenaar-Oost (Zvo) – Arnhem (Ah) –	815	Ah (not specific)

Table 5.5-2 Start and end locations

During the execution of the route, the following steps must be performed.

Step	Action / Control
Pre	• Level is Level NTC-ATB • Mode in SN • Route is set from start location 1 to end location 1
1	When receiving the connection establishment order from the balise group, verify that: a. DMI shows connection setup with the RBC (only for onboard with B2)
2	Train is running towards transition signal. When receiving the level transition announcement, verify that: a. DMI shows level transition announcement b. DMI shows connection establishment with the RBC
3	When train front end passes start of level acknowledgement window (not for onboards with B3R2+Art10SP2017), verify that: a. DMI shows level acknowledgement request b. Driver acknowledges level transition within 5 seconds after passing transition location

Step	Action / Control
4	When passing transition signal, verify that: a. DMI shows level change to Level 2 b. DMI shows mode change to mode FS c. no brakes applied d. DMI shows no braking (pre)-indication
5	When receiving track conditions at voltage change over, verify that a. DMI shows track condition information (announcement, start and end) at the defined locations b. If applicable the train systems show correct behaviour at the defined locations
6	When train is at end location 1, driver continues next scenario

Table 5.5-3 Scenario steps 1

Step	Action / Control
Pre	• Level is Level 2 • Mode in FS • Route is set from start location 2 to end location 2
1	When receiving level transition order to Level NTC-PZB, verify that: a. DMI shows level transition announcement to Level NTC-PZB
2	When the train front end passes the start of the level transition acknowledgement, verify that: a. DMI show level acknowledgement request b. Driver acknowledges level transition within 5 seconds after passing transition location
3	When passing the level transition location, verify that: a. DMI show level change to Level NTC-PZB b. DMI shows mode change to mode SN
4	When train is stopped at end location 2, driver closes desk

Table 5.5-4 Scenario steps 2

Step	Action / Control
Pre	• Train direction is changed • Level is Level NTC-PZB • Mode in SN • Route is set from start location 3 to end location 3
1	When receiving the connection establishment order from the balise group, verify that: a. DMI shows connection setup with the RBC (only for onboard with B2)
2	Train is running towards transition signal. When receiving the level transition announcement, verify that: a. DMI shows level transition announcement b. DMI shows connection establishment with the RBC
3	When train front end passes start of level acknowledgement window (not for onboards with B3R2+Art10SP2017), verify that: a. DMI shows level acknowledgement request b. Driver acknowledges level transition within 5 seconds after passing transition location

Step	Action / Control
4	When passing transition signal, verify that: a. DMI shows level change to Level 2 b. DMI shows mode change to mode FS c. no brakes applied d. DMI shows no braking (pre)-indication
5	When train is at end location 3, driver closes desk

Table 5.5-5 Scenario steps 3

Step	Action / Control
Pre	• Level is Level 2 • Mode in SB • Route is set from start location 4 to end location 4
1	When driver perform Start of Mission procedure, verify that: a. DMI shows level remaining Level 2 b. DMI shows mode change to mode OS c. DMI shows OS acknowledgement request d. Driver acknowledges OS acknowledgement request
2	When passing signal with balise group, verify that: a. DMI shows level remaining Level 2 b. DMI shows mode change to mode FS c. no brakes applied
3	When receiving track conditions at voltage change over, verify that a. DMI shows track condition information (announcement, start and end) at the defined locations b. If applicable the train systems show correct behaviour at the defined locations
4	When receiving level transition order to Level NTC-ATB, verify that: DMI shows level transition announcement to Level NTC-ATB
5	When passing the level transition location, verify that: a. DMI show level change to Level NTC-ATB b. DMI shows mode change to mode SN c. no brakes applied
6	When train is at end location 4, driver closes desk

Table 5.5-6 Scenario steps 4

Step	Action / Control
1	When leading engine desk is open, verify that: a. Non-leading cab in mode NL: DMI shows level is according to leading engine (except for distance between engines at transition locations) b. Non-leading cab in mode NL: DMI shows mode is mode NL c. Non-leading cab in mode SL: DMI is in sleeping state

Table 5.5-7 Scenario steps non-leading engine

5.5.2 Exit when failure NTC-PZB

This operational scenario is a normal run when the NTC-PZB is in failure and not isolated at the German-Dutch Border at Zevenaar-Oost. Due to the failure of the NTC the driver is not able to make a dynamic transition from ETCS to PZB. Based on German engineering rules the transition to Level 0 is

made with a speed restriction and text message to the driver. For the outcome of the test the applicant is advised to consult the German infrastructure manager and German national safety authority.

The following steps must be performed.

Step	Action / Control
Pre	• NTC-PZB is in failure and not isolated • Level is the applicable level valid for the ERTMS trackside • Routes are set passing the exit of the ERTMS area with NORM
1	Train is running towards exit of ERTMS area. Verify that: a. DMI shows mode is mode FS b. DMI shows a message indicating the unavailability of the NTC-PZB[15]
2	When receiving level transition order to Level NTC-PZB, verify that a. DMI shows level transition announcement to Level 0 b. DMI shows speed restriction of 20 km/h in advance of transition location
4	When passing the level transition location, verify that: a. DMI shows level change to Level 0 b. DMI shows mode change to mode UN c. DMI shows a message about failure PZB

Table 5.5-8 Scenario steps

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[15] Depending on onboard implementation this message is displayed at the startup of the system or when the level transition order is received. The message could be displayed a certain amount of time and could not be shown again.

5.6   ERTMS track Hanzelijn

5.6.1   Confidence run over complete track

This operational scenario is a normal run over the ERTMS track of multiple ESC types in both directions. The dispatcher sets all routes with normal aspects (NORM). The driver shall react on DMI or trackside signals according to normal operations. The driving speed is the maximum allowed speed. There are no special actions required from both dispatcher and driver. The locations of the route are described in Table 5.6-1 Route settings. The start and end locations area described in Table 5.6-2 Start and end locations. For non-leading engines Table 5.6-10 Scenario steps non-leading engine is applicable during the complete operational scenario.

Id	Route	Route setting
1	Zwolle (Zl) – Hattemerbroek aansluiting (Hba)	NORM: Zl -> GG16
2	Hattemerbroek aansluiting (Hba) – Swifterbant (Stb)	NORM: GG16 -> 2201/2202
3	Swifterbant (Stb) – Lelystad (Lls)	NORM: 2201/2202 -> Lls
4	Lelystad (Lls) – Swifterbant (Stb)	NORM: Lls -> 2203/2204
5	Swifterbant (Stb)– Dronten (Dron)	NORM: 2203/2204 -> 2504
6	Dronten (Dron) – Hattemerbroek aansluiting (Hba)	NORM: 2504 -> GT15
7	Hattemerbroek aansluiting (Hba) – Zwolle (Zl)	NORM: GT15 -> Zl

Table 5.6-1 Route settings

Id	Location	Start location	End location
1	Zwolle (Zl) – Hattemerbroek aansluiting (Hba)	Zl (not specific)	GG16
2	Hattemerbroek aansluiting (Hba) – Swifterbant (Stb)	GG16	2201/2202
3	Swifterbant (Stb) – Lelystad (Lls)	2201/2202	Lls (not specific)
4	Lelystad (Lls) – Swifterbant (Stb)	Lls (not specific)	2203/2204
5	Swifterbant (Stb)– Dronten (Dron)	2203/2204	2504
6	Dronten (Dron) – Hattemerbroek aansluiting (Hba)	2504	GT15
7	Hattemerbroek aansluiting (Hba) – Zwolle (Zl)	GT15	Zl (not specific)

Table 5.6-2 Start and end locations

During the execution of the route, the following steps must be performed.

Step	Action / Control
Pre	- Level is Level NTC-ATB - Mode in SN - Route is set from start location 1 to end location 1
1	When receiving the connection establishment order from the balise group, verify that: a. DMI shows connection setup with the RBC (only for onboard with B2)

Step	Action / Control
2	Train is running towards transition signal. When receiving the level transition announcement, verify that: a. DMI shows level transition announcement b. DMI shows connection establishment with the RBC
3	When train front end passes start of level acknowledgement window (not for onboards with B3R2+Art10SP2017), verify that: a. DMI shows level acknowledgement request b. Driver acknowledges level transition within 5 seconds after passing transition location
4	When passing transition signal, verify that: a. DMI shows level change to Level 2 b. DMI shows mode change to mode FS c. no brakes applied d. DMI shows no braking (pre)-indication
5	When train is at end location 1, driver continues next scenario

Table 5.6-3 Scenario steps 1

Step	Action / Control
Pre	• Level is Level 2 • Mode in FS • Route is set from start location 2 to end location 2
1	When passing signals, verify that: a. DMI shows level remaining Level 2 b. DMI shows mode remaining mode FS c. no brakes applied
2	When receiving track conditions non stopping area, verify that: a. DMI shows track condition information (announcement, start and end) at the defined locations
3	When receiving track conditions air tightness, verify that: a. DMI shows track condition information (announcement, start and end) at the defined locations b. If applicable the train systems show correct behaviour at the defined locations
4	When train is at end location 2, driver continues next scenario

Table 5.6-4 Scenario steps 2

Step	Action / Control
Pre	• Level is Level 2 • Mode in FS • Route is set from start location 3 to end location 3
1	When receiving level transition order to Level NTC-ATB, verify that: a. DMI shows level transition announcement to Level NTC-ATB
2	When the train front end passes the start of the level transition acknowledgement, verify that: a. DMI show level acknowledgement request b. Driver acknowledges level transition within 5 seconds after passing transition location

Step	Action / Control

3	When passing the level transition location, verify that:
	  a. DMI show level change to Level NTC-ATB
	  b. DMI shows mode change to mode SN

4	When train is stopped at end location 3, driver closes desk

Table 5.6-5 Scenario steps 3

Step	Action / Control
Pre	• Train direction is changed • Level is Level NTC-ATB • Mode in SN • Route is set from start location 4 to end location 4
1	When receiving the connection establishment order from the balise group, verify that: a. DMI shows connection setup with the RBC (only for onboard with B2)

2	Train is running towards transition signal. When receiving the level transition announcement (not for onboards with B3R2+Art10SP2017), verify that:
	  a. DMI shows level transition announcement
	  b. DMI shows connection establishment with the RBC

3	When train front end passes start of level acknowledgement window, verify that:
	  a. DMI shows level acknowledgement request
	  b. Driver acknowledges level transition within 5 seconds after passing transition location

4	When passing transition signal, verify that:
	  a. DMI shows level change to Level 2
	  b. DMI shows mode change to mode FS
	  c. no brakes applied
	  d. DMI shows no braking (pre)-indication

5	When train is at end location 4, driver continues next scenario

Table 5.6-6 Scenario steps 4

Step	Action / Control
Pre	• Level is Level 2 • Mode in FS • Route is set from start location 5 to end location 5

1	When passing signals, verify that:
	  a. DMI shows level remaining Level 2
	  b. DMI shows mode remaining mode FS
	  c. no brakes applied

2	When approaching end of route, verify that a. DMI shows braking curve to EoA
3	When train is stopped at end location 5, driver closes desk

Table 5.6-7 Scenario steps 5

Step	Action / Control
Pre	• Level is Level 2 • Mode in SB • Route is set from start location 6 to end location 6

Step	Action / Control
1	When driver perform Start of Mission procedure, verify that: a. DMI shows level remaining Level 2 b. DMI shows mode change to mode OS c. DMI shows OS acknowledgement request d. Driver acknowledges OS acknowledgement request
2	When passing signal with balise group, verify that: a. DMI shows level remaining Level 2 b. DMI shows mode change to mode FS c. no brakes applied
3	When passing signals, verify that: a. DMI shows level remaining Level 2 b. DMI shows mode remaining mode FS c. no brakes applied
4	When receiving track conditions non stopping area, verify that: a. DMI shows track condition information (announcement, start and end) at the defined locations
5	When receiving track conditions air tightness, verify that: a. DMI shows track condition information (announcement, start and end) at the defined locations b. If applicable the train systems show correct behaviour at the defined locations
6	When train is at end location 6, driver continues next scenario

Table 5.6-8 Scenario steps 6

Step	Action / Control
Pre	• Level is Level 2 • Mode in FS • Route is set from start location 7 to end location 7
1	When receiving level transition order to Level NTC-ATB, verify that: a. DMI shows level transition announcement to Level NTC-ATB
2	When passing the level transition location, verify that: a. DMI show level change to Level NTC-ATB b. DMI shows mode change to mode SN c. no brakes applied
3	When train is stopped at end location 7, driver closes desk

Table 5.6-9 Scenario steps 7

Step	Action / Control
1	When leading engine desk is open, verify that: a. Non-leading cab in mode NL: DMI shows level is according to leading engine (except for distance between engines at transition locations) b. Non-leading cab in mode NL: DMI shows mode is mode NL c. Non-leading cab in mode SL: DMI is in sleeping state

Table 5.6-10 Scenario steps non-leading engine

5.6.2   Exit when failure NTC-ATB

Use scenario in 5.10.1 Exit when failure NTC-ATB. Cross acceptance with other ESC types is not possible.

5.6.3 Running in OS
Use scenario in 5.10.2 Entering OS. Cross acceptance with other ESC types is not possible.

5.6.4 Entrance specialties from ATB to ERTMS
This operational scenario contains special entrance scenarios. Figure 5.6-1 shows the situations of the entrance as used. The train starts in rear of signal 102 (or one or more signals before to start before the first balise group). The dispatcher sets all routes according to Table 5.6-11. After all routes are set, the train runs the route following the signals and DMI information. The driver has to operate according the operation rules applicable for the situation. The route setting ends at signal 204[16].

On Hanzelijn track the entry transition is completely controlled by the RBC and is depending on position reports of the train.
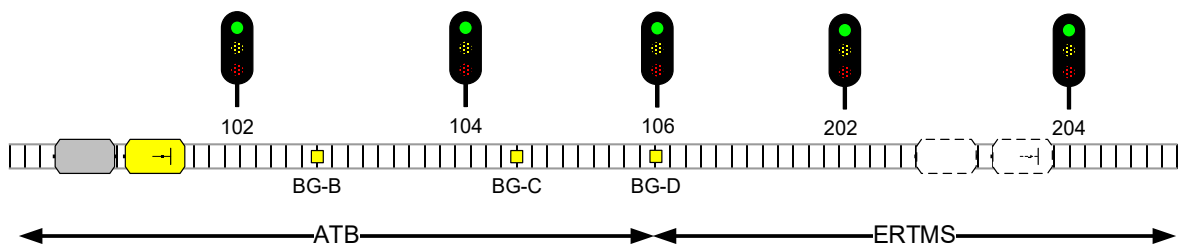

Figure 5.6-1 Entrance situation

Scenario	Description	102	104	106	202
9.4a	NORM-ROZ	NORM	NORM	ROZ	ROZ
9.4b	ROZ-NORM	NORM	ROZ	NORM	NORM
9.4c	ROZ-ROZ	NORM	ROZ	ROZ	ROZ
9.4d	STS-NORM	NORM	NORM	STOP	NORM
9.4e	Radio failure / Section timer expiration	NORM	NORM	NORM	NORM

Table 5.6-11 Route settings

Scenario	Description	102	104	106	202
9.4a	NORM-ROZ	SN/ATB	SN/ATB	OS	OS
9.4b	ROZ-NORM	SN/ATB	SN/ATB	FS	FS
9.4c	ROZ-ROZ	SN/ATB	SN/ATB	OS	OS
9.4d	STS-NORM	SN/ATB	SN/ATB	TR	FS
9.4e	Radio Failure/ Section timer expiration	SN/ATB	SN/ATB	TR	SR

Table 5.6-12 Mode after passing signal

Scenario 9.4e is a special scenario for Hanzelijn track about radio failure before entering inside the Level 2 area leading to the expiration of section timer and the train trip at the border. In this scenario the entry route is set, but the train does not enter immediately inside the Level 2 area. The radio connection is lost after the reception of the entrance MA message, then the section timer part of the MA message expires, and the MA is shortened onboard at the border leading to a train trip when crossing signal 106.

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[16] Unless signal 204 is a P-sein and will automatically switch to yellow or green if the track is not occupied.

For each scenario the following steps must be performed.

Step	Action / Control
Pre	• level is Level NTC-ATB • mode is SN • route is set according to Table 5.6-11.
1	When receiving the connection establishment order from the balise group, verify that: a. DMI shows connection setup with the RBC (only for onboard with B2)
2	When passing signal 102, verify that: a. DMI shows correct ATB code
3	When passing signal 104, verify that: a. DMI shows correct ATB code
4	When receiving the level transition announcement, verify that: c. DMI shows level transition announcement d. DMI shows connection establishment with the RBC
5	When train front end passes start of level acknowledgement window (not for onboards with B3R2+Art10SP2017), verify that: a. DMI shows level acknowledgement request b. Driver acknowledges level transition within 5 seconds after passing transition location
6	Only scenario 9.4e: Train stops before signal 106 and radio connection fails. When connection to the RBC is lost, verify that: a. DMI shows connection lost with the RBC
7a	When passing signal 106 (not scenario 9.4d and 9.4e), verify that: a. DMI shows level change to Level 2 b. DMI shows mode according to Table 5.6-12 c. DMI shows no ATB code
7b	Only scenario 9.4d: When passing signal 106, verify that: a. DMI shows level change to Level 2 b. DMI shows mode change to mode TR[17] c. Driver acknowledges PT mode and request start and runs in SR/OS
7c	Only scenario 9.4e: When passing signal 106 after the section timer expired and the train has not passed the Section Time Out Stop Location, verify that: a. DMI shows level change to Level 2 b. DMI shows mode change to mode TR c. Driver acknowledges PT mode and request start and runs in SR/OS
8	Only scenario 9.4a and 9.4c: Verify that: a. DMI shows an OS acknowledgement request b. Driver acknowledges OS acknowledgement request
9	Only scenario 9.4a and 9.4c: Before passing signal 202, verify that: a. DMI shows no OS acknowledgement request
10	When passing signal 202, verify that: a. DMI shows level is Level 2 b. DMI shows mode according to Table 5.6-12 c. DMI shows movement authority ending at or in advance of signal 204

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[17] If ATB-Vv beacons are placed at the signal: when the onboard is not already switched to TR, a brake invention will be triggered while passing the ATB-Vv beacons.

Step	Action / Control
11	When receiving National Values for braking curves, verify that:
	a. for non-System Version 1.1 compatible onboards National Values for braking curves is discarded; other information of the balise groups shall be considered
	b. for System Version 1.1 compatible onboards: all information of the balise groups shall be considered and the braking characteristics updated

Table 5.6-13 Scenario steps

5.6.5 Exit specialties to ATB

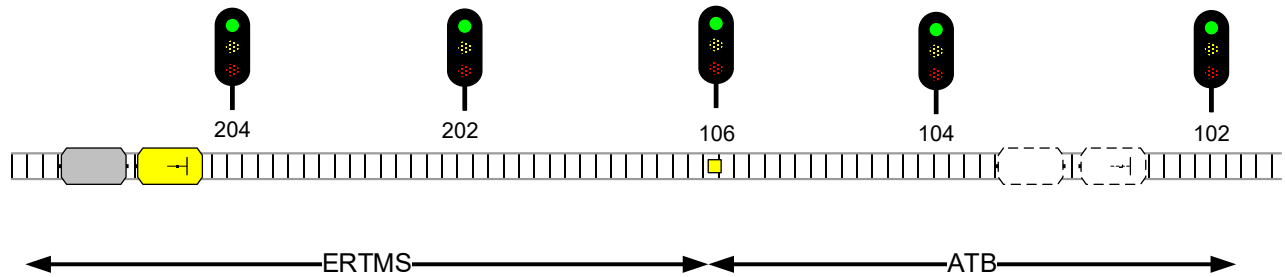This operational scenario contains special exit scenarios.

Figure 5.6-2 Exit situation

Figure 5.6-2 shows the situation of the exit as used. The train starts in rear of signal 204. The Dispatcher sets all routes according Table 5.6-14. After all routes are set, the train runs the route following the signals and DMI information. The driver has to operate according the operational rules applicable for the situation.

On the track Hanzelijn, it is possible to set Temporary Speed Restriction from the RBC outside the Level 2 area.

Scenario	Description	204	202	106	104
9.5a	NORM-ROZ	NORM	NORM	ROZ	NORM
9.5b	ROZ-NORM	NORM	ROZ	NORM	NORM
9.5c	ROZ-ROZ	NORM	ROZ	ROZ	NORM
9.5d	STS-NORM	NORM	NORM	STOP	NORM
9.5e	NORM-NORM with TSR	NORM	NORM	NORM	NORM

Table 5.6-14 Route settings

Scenario	Description	204	202	106	104
9.5a	NORM-ROZ	FS	FS	SN/ATB	SN/ATB
9.5b	ROZ-NORM	FS	OS	SN/ATB	SN/ATB
9.5c	ROZ-ROZ	FS	OS	SN/ATB	SN/ATB
9.5d	STS-NORM	FS	FS	SN/ATB	SN/ATB
9.5e	NORM-NORM with TSR	FS	FS	SN/ATB	SN/ATB

Table 5.6-15 Mode after passing signal

For each scenario the following steps must be performed.

Step	Action / Control
Pre	• level is Level 2 • mode is according to Table 5.6-15 • route is set according Table 5.6-14
1	When passing signal 204, verify that: a. DMI shows mode according to Table 5.6-15
2	Only scenario 9.5b and 9.5c: Before passing signal 202, verify that: a. DMI shows braking curve ending at signal 202 with no release speed b. DMI shows an OS acknowledgement request c. When driver acknowledge OS acknowledgement, DMI shows MA extension to signal 106
3	When passing signal 202, verify that: a. DMI shows mode according to Table 5.6-15
4	Before passing signal 106 (not scenario 9.5d), verify that: a. DMI shows announcement level transition to Level NTC-ATB[18]
5	When train front end passes start of level acknowledgement window (not scenario 9.5d), verify that: a. DMI shows level acknowledgement request b. Driver acknowledges level transition within 5 seconds after passing transition location
6a	Only scenario 9.5e: Before passing signal 106, verify that: a. DMI shows the speed restriction which has been set after the border
6b	Only scenario 9.5a and 9.5c: Before passing signal 106, verify that: a. DMI shows braking curve ending at signal 106 with no release speed b. DMI shows an OS acknowledgement request c. When driver acknowledge OS acknowledgement, DMI shows MA extension to signal 104
7a	When passing signal 106 (not scenario 9.5d), verify that: a. DMI shows level change to Level NTC-ATB b. DMI shows mode change to mode SN[19] c. DMI shows correct ATB code
7b	Only scenario 9.5d: When passing signal 106, verify that: a. DMI shows level change to Level NTC-ATB b. DMI shows mode change to mode TR c. brakes are applied d. when driver acknowledge the Trip, DMI shows mode change to mode SN e. DMI shows level acknowledgement request f. Driver acknowledges level transition
8	When termination order is received, verify that: a. DMI shows termination of the RBC connection
9	When passing signal 104, verify that: a. DMI shows correct ATB code

Table 5.6-16 Scenario steps

5.6.6   Movement revocation

Use scenario in 5.10.3 Movement revocation. Cross acceptance with other ESC types is not possible.

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[18] Situations can occur where an already announced level transition is repeated from the trackside. The reception of this repeated level transition order may not interfere with the announced level transition order in the case that the contents are similar.

[19] For scenario 9.5b depending on the level transition location and the train confidence interval the DMI shows shortly mode change to mode FS before mode change to SN

5.6.7   Override (STS passage)

Use scenario in 5.10.4 Override (STS passage). Cross acceptance with other ESC types is not possible.

5.6.8   Signal passed at danger

Use scenario in 5.10.5 Signal passed at danger. Cross acceptance with other ESC types is not possible.

5.6.9   Change direction

Use scenario in 5.10.6 Change direction. Cross acceptance with other ESC types is not possible.

5.7   ERTMS Track HSL-South

5.7.1   Confidence run over complete track

This operational scenario is a normal run over the ERTMS track of multiple ESC types. The dispatcher sets all routes with normal aspects (NORM). The driver shall react on DMI or trackside signals according to normal operations. The driving speed is the maximum allowed speed. There are no special actions required from both dispatcher and driver. The locations of the route are described in Table 5.7-1 Route settings. The start and end locations area described in Table 5.7-2 Start and end locations. For non-leading engines Table 5.7-11 Scenario steps non-leading engine is applicable during the complete operational scenario.

The following trackside configuration must be used:
- HSL-South (Northern section) operates in ERTMS Level 1
- HSL-South (Southern section) operates in ERTMS Level 2

Id	Route	Route setting
1	Schiphol (Shl) – Hoofddorp aansluiting (Hfdea)	Shl -> HZ/HY -> 209/201 -> 231 -> MZ
2	Hoofddorp aansluiting (Hfdea) – HSL Hoogmade Overloopwissels (Hshmdo)	MZ -> MY -> MX -> MW ->MV -> MU
3	HSL Hoogmade Overloopwissels (Hshmdo) – Rotterdam Westelijke splitsing (Wspl)	MU -> MT -> MR -> ….. -> MC
4	Rotterdam Westelijke splitsing (Wspl) – Rotterdam (Rtd)	MC -> Rtd
5	Rotterdam (Rtd) – Barendrecht overloopwissels (Brda)	Rtd -> HG -> BH -> SA -> SB
6	Barendrecht overloopwissels (Brda) – Zevenbergschen Hoek aansluiting (Zha)	SB -> SJ
7	Zevenbergschen Hoek aansluiting (Zha)	SJ -> SK -> SL -> SM -> XZ1
8	Zevenbergschen Hoek aansluiting (Zha) – Breda (Bd)	XZ1 -> Bd

Table 5.7-1 Route settings

Id	Location	Start location	End location
1	Schiphol (Shl) – Hoofddorp aansluiting (Hfdea)	Shl (not specific)	MZ
2	Hoofddorp aansluiting (Hfdea) – HSL Hoogmade Overloopwissels (Hshmdo)	MZ	MU, in rear of infill balise group SMB2158 at km 136.889
3	HSL Hoogmade Overloopwissels (Hshmdo) – Rotterdam (Rtd)	MU, in rear of infill balise group SMB2158 at km 136.889	MC
4	Rotterdam Westelijke splitsing (Wspl) – Rotterdam (Rtd)	MC	Rtd (not specific)
5	Rotterdam (Rtd) –	Rtd (not specific)	SB

Id	Location	Start location	End location
6	Barendrecht overloopwissels (Brda) – Zevenbergschen Hoek aansluiting (Zha)	SB	SJ, approx. 100m in rear of SMB 2332
7	Zevenbergschen Hoek aansluiting (Zha)	SJ, approx. 100m in rear of SMB 2332	XZ1
8	Zevenbergschen Hoek aansluiting (Zha) – Breda (Bd)	XZ1	Bd (not specific)

Table 5.7-2 Start and end locations

During the execution of the route, the following steps must be performed.

Step	Action / Control
Pre	• Level is Level NTC-ATB • Mode in SN • Route is set from start location 1 to end location 1
1	When receiving the connection establishment order from the balise group, verify that: a. DMI shows connection setup with the RBC (only for onboard with B2) b. DMI shows connection is not established with the RBC
2	Train is running towards transition signal. When receiving the level transition announcement, verify that: a. DMI shows level transition announcement
3	When train front end passes start of level acknowledgement window (not or onboards with B3R2+Art10SP2017), verify that: a. DMI shows level acknowledgement request b. Driver acknowledges level transition within 5 seconds after passing transition location
4	When passing transition location, verify that: a. DMI shows level change to Level 1 b. DMI shows mode change to mode FS c. no brakes applied d. DMI shows no braking (pre)-indication
5	When receiving track conditions at voltage change over, verify that: a. DMI shows track condition information (announcement, start and end) at the defined locations b. If applicable the train systems show correct behaviour at the defined locations
6	When train is at end location 1, driver continues next scenario

Table 5.7-3 Scenario steps 1

Step	Action / Control
Pre	• Level is Level 1 • Mode in FS • Route is set from start location 2 to end location 2
1	When passing signals, verify that: a. DMI shows level remaining Level 1 b. DMI shows mode remains mode FS c. no brakes applied

Step	Action / Control
2	When receiving track conditions non stopping area, verify that: a. DMI shows track condition information (announcement, start and end) at the defined locations
3	When receiving track conditions air tightness, verify that: a. DMI shows track condition information (announcement, start and end) at the defined locations b. If applicable the train systems show correct behaviour at the defined locations
4	When approaching end of route, verify that: a. DMI shows braking curve to EoA
5	When train is at end location 2, driver closes desk

Table 5.7-4 Scenario steps 2

Step	Action / Control
Pre	• Level is Level 1 • Mode in SB • Route is set from start location 3 to end location 3
1	When driver perform Start of Mission procedure, verify that: c. DMI shows level remaining Level 1 d. DMI shows mode change to mode SR
2	When passing infill balise group, verify that a. DMI shows level remaining Level 1 b. DMI shows mode remaining mode SR
3	When passing SMB 2158, verify that: a. DMI shows level remaining Level 1 b. DMI shows mode change to mode FS c. no brakes applied
4	When passing signals, verify that: a. DMI shows level remaining Level 1 b. DMI shows mode remaining mode FS c. no brakes applied
5	When receiving track conditions at voltage change over or phase lock, verify that: a. DMI shows track condition information (announcement, start and end) at the defined locations b. If applicable the train systems show correct behaviour at the defined locations
6	When train is at end location 3, driver continues next scenario

Table 5.7-5 Scenario steps 3

Step	Action / Control
Pre	• Level is Level 2 • Mode in FS • Route is set from start location 4 to end location 4
1	When receiving level transition order to Level NTC-ATB, verify that: a. DMI shows level transition announcement to Level NTC-ATB

Step	Action / Control
2	When the train front end passes the start of the level transition acknowledgement, verify that: a. DMI show level acknowledgement request b. Driver acknowledges level transition within 5 seconds after passing transition location
3	When passing the level transition location, verify that: a. DMI show level change to Level NTC-ATB b. DMI shows mode change to mode SN
4	When train is stopped at end location 4, driver closes desk

Table 5.7-6 Scenario steps 4

Step	Action / Control
Pre	• Level is Level NTC-ATB • Mode in SN • Route is set from start location 5 to end location 5
1	When receiving the connection establishment order from the balise group, verify that: a. DMI shows connection setup with the RBC (only for onboard with B2)
2	Train is running towards transition signal. When receiving the level transition announcement, verify that: a. DMI shows level transition announcement b. DMI shows connection establishment with the RBC
3	When train front end passes start of level acknowledgement window (not for onboards with B3R2+Art10SP2017), verify that: a. DMI shows level acknowledgement request b. Driver acknowledges level transition within 5 seconds after passing transition location
4	When passing transition location, verify that: a. DMI shows level change to Level 1 b. DMI shows mode change to mode FS c. no brakes applied d. DMI shows no braking (pre)-indication
5	When onboard receives level transition order to Level 2, verify that: a. DMI shows level transition announcement
6	When passing SMB 2252, verify that: a. DMI shows level change to Level 2 b. DMI shows mode remaining mode FS c. no brakes applied
7	When train is at end location 5, driver continues next scenario

Table 5.7-7 Scenario steps 5

Step	Action / Control
Pre	• Level is Level 2 • Mode in FS • Route is set from start location 6 to end location 6

Step	Action / Control
1	When passing signals, verify that: a. DMI shows level remaining Level 2 b. DMI shows mode remaining mode FS c. no brakes applied
2	When receiving track conditions at voltage change over, verify that: a. DMI shows track condition information (announcement, start and end) at the defined locations b. If applicable the train systems show correct behaviour at the defined locations
3	When receiving track conditions non stopping area, verify that: a. DMI shows track condition information (announcement, start and end) at the defined locations
4	When receiving track conditions air tightness, verify that: a. DMI shows track condition information (announcement, start and end) at the defined locations b. If applicable the train systems show correct behaviour at the defined locations
5	When approaching end of route, verify that: a. DMI shows braking curve to EoA
6	When train is stopped at end location 6, driver closes desk

Table 5.7-8 Scenario steps 6

Step	Action / Control
Pre	• Level is Level 2 • Mode in SB • Route is set from start location 7 to end location 7
1	When driver perform Start of Mission procedure, verify that: a. DMI shows level remaining Level 2 b. DMI shows mode is mode SR
2	When approaching signal, verify that: a. DMI shows level remaining Level 2 b. DMI shows TAF request c. When driver acknowledges TAF request, DMI shows mode change to mode FS d. no brakes applied
3	When passing signals, verify that: a. DMI shows level remaining Level 2 b. DMI shows mode remaining mode FS c. no brakes applied
4	When receiving track conditions at phase lock, verify that a. DMI shows track condition information (announcement, start and end) at the defined locations b. If applicable the train systems show correct behaviour at the defined locations
5	When receiving track conditions at voltage change over, verify that a. DMI shows track condition information (announcement, start and end) at the defined locations b. If applicable the train systems show correct behaviour at the defined locations

Step	Action / Control
6	When approaching end of route, verify that: a. DMI shows braking curve to EoA
7	When train is at end location 7, driver stops without closing desk

Table 5.7-9 Scenario steps 7

Step	Action / Control
Pre	• Level is Level 2 • Mode in FS • Route is set from start location 8 to end location 8
1	When receiving level transition order to Level NTC-ATB, verify that: a. DMI shows level transition announcement to Level NTC-ATB b. DMI shows permitted speed according to aspect signal 506
2	When the train front end passes the start of the level transition acknowledgement, verify that: a. DMI show level acknowledgement request b. Driver acknowledges level transition within 5 seconds after passing transition location
3	When passing the level transition location, verify that: a. DMI show level change to Level NTC-ATB b. DMI shows mode change to mode SN
4	When train is stopped at end location 8, driver closes desk

Table 5.7-10 Scenario steps 8

Step	Action / Control
1	When leading engine desk is open, verify that: a. Non-leading cab in mode NL: DMI shows level is according to leading engine (except for distance between engines at transition locations) b. Non-leading cab in mode NL: DMI shows mode is mode NL c. Non-leading cab in mode SL: DMI is in sleeping state

Table 5.7-11 Scenario steps non-leading engine

5.7.2   Exit when failure NTC-ATB

Use scenario in 5.10.1 Exit when failure NTC-ATB. Cross acceptance with other ESC types is not possible.

5.7.3   Running in OS

Use scenario in 5.10.2 Entering OS. Cross acceptance with other ESC types is not possible.

5.7.4   Entrance specialties from ATB to ERTMS

This operational scenario contains special entrance scenarios. Figure 5.7-1 shows the situation of the entrance. The train starts in rear of signal 102 (or one or more signals before to start before the first balise group). The dispatcher sets all routes according to Table 5.7-12. After all routes are set, the train runs the route following the signals and DMI information. The driver has to operate according the operation rules applicable for the situation. The route setting ends at signal 204.
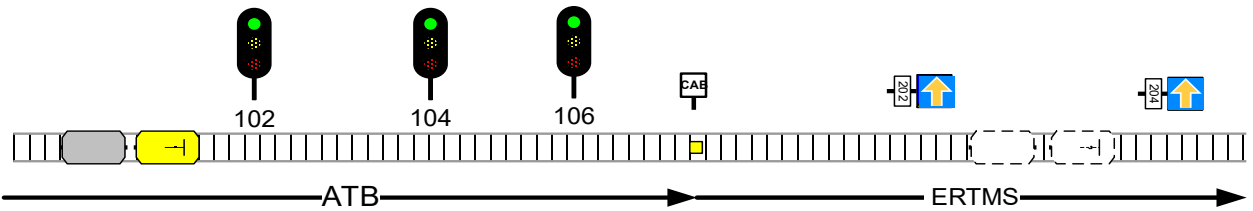
Figure 5.7-1 Entrance situation

Scenario	Description	102	104	106	202
6.4a	NORM-ROZ	NORM	NORM	ROZ	ROZ
6.4b	ROZ-NORM	NORM	ROZ	NORM	NORM
6.4c	ROZ-ROZ	NORM	ROZ	ROZ	ROZ
6.4d	STS-NORM	NORM	NORM	STOP	NORM

Table 5.7-12 Route settings

Scenario	Description	102	104	106	202
6.4a	NORM-ROZ	SN/ATB	SN/ATB	OS	OS
6.4b	ROZ-NORM	SN/ATB	SN/ATB	FS	FS
6.4c	ROZ-ROZ	SN/ATB	SN/ATB	OS	OS
6.4d	STS-NORM	SN/ATB	SN/ATB	SN/ATB	FS

Table 5.7-13 Mode after passing signal

Each scenario must be performed twice, once with the trackside in Level 1 and once with the trackside in Level 2. Different scenario steps are applicable as described below.

For each scenario the following steps must be performed. HSL-South operates in Level 1

Step	Action / Control
Pre	• level is Level NTC-ATB • mode is SN • route is set according to Table 5.7-12.
1	When passing signal 102, verify that: a. DMI shows correct ATB code
2	When passing signal 104, verify that: a. DMI shows correct ATB code
3	When receiving the connection establishment order from the balise group, verify that: a. DMI shows connection setup with the RBC (only for onboard with B2)
4a	When passing signal 106 (not scenario 6.4d), verify that: a. DMI shows level transition announcement b. DMI shows no connection establishment with the RBC
4b	Only scenario 6.4d: When passing signal 106, verify that: a. DMI shows level is Level NTC-ATB[20] b. DMI shows no connection establishment with the RBC
5	When train front end passes start of level acknowledgement window (not scenario 6.4d) (not for onboards with B3R2+Art10SP2017), verify that: a. DMI shows level acknowledgement request b. Driver acknowledges level transition within 5 seconds after passing transition location

[20] If ATB-Vv beacons are placed at the signal: a brake invention will be triggered while passing the ATB-Vv beacons

Step	Action / Control
6a	When passing level transition location (not scenario 6.4d), verify that: a. DMI shows level change to Level 1 b. DMI shows mode according to Table 5.7-13 c. DMI shows no ATB code
6b	Only scenario 6.4d: When passing level transition location, verify that: a. DMI shows level remaining to Level NTC-ATB b. DMI shows mode according to Table 5.7-13 c. When driver selects override function and within 30 seconds Level 1, DMI shows level change to Level 1 and mode change to SR
7	Only scenario 6.4a and 6.4c: Verify that: a. DMI shows an OS acknowledgement request b. Driver acknowledges OS acknowledgement request
8	Only scenario 6.4a, 6.4c and 6.4d: Before passing signal 202, verify that: a. infill information transmitted from the infill balise group (approximately 800m in rear of the signal) is rejected b. information is only accepted from the balise group at signal 202
9	Only scenario 6.4a and 6.4c: Before passing signal 202, verify that: a. DMI shows no OS acknowledgement request.
10	When passing signal 202, verify that: a. DMI shows level is Level 1 b. DMI shows mode according to Table 5.7-13 c. DMI shows movement authority ending at or in advance of signal 204
11	When receiving National Values for braking curves, verify that: a. for non-System Version 1.1 compatible onboards National Values for braking curves is discarded; other information of the balise groups shall be considered b. for System Version 1.1 compatible onboards: all information of the balise groups shall be considered and the braking characteristics updated

Table 5.7-14 Scenario steps with HSL-South in Level 1

For each scenario the following steps must be performed. HSL-South operates in Level 2

Step	Action / Control
Pre	• level is Level NTC-ATB • mode is SN • route is set according to Table 5.7-12.
1	When passing signal 102, verify that: a. DMI shows correct ATB code
2	When passing signal 104, verify that: a. DMI shows correct ATB code
3	When receiving the connection establishment order from the balise group, verify that: a. DMI shows connection setup with the RBC (only for onboard with B2)
4a	When passing signal 106 (not scenario 6.4d), verify that: a. DMI shows level transition announcement b. DMI shows connection establishment with the RBC
4b	Only scenario 6.4d: When passing signal 106, verify that: a. DMI shows level is Level NTC-ATB[21] b. DMI shows connection establishment with the RBC

[21] If ATB-Vv beacons are placed at the signal: a brake invention will be triggered while passing the ATB-Vv beacons

Step	Action / Control
5	When train front end passes start of level acknowledgement window (not scenario 6.4d), verify that: a. DMI shows level acknowledgement request b. Driver acknowledges level transition within 5 seconds after passing transition location
6a	When passing level transition location (not scenario 6.4d), verify that: a. DMI shows level change to Level 1 b. DMI shows mode according to Table 5.7-13
6b	Only scenario 6.4d: When passing level transition location, verify that: a. DMI shows level remaining to Level NTC-ATB b. DMI shows mode according to Table 5.7-13 c. When driver selects override function and within 30 seconds Level 1, DMI shows level change to Level 1 and mode change to SR
7	Only scenario 6.4a and 6.4c: Verify that: a. DMI shows an OS acknowledgement request b. Driver acknowledges OS acknowledgement request
8	When onboard receives level transition order to Level 2, verify that: a. DMI shows level transition announcement
9	Only scenario 6.4a and 6.4c: Before passing signal 202, verify that: a. infill information transmitted from the infill balise group (approximately 800m in rear of the signal) is rejected b. information is only accepted from the balise group at signal 202
10	Only scenario 6.4a and 6.4c: Before passing signal 202, verify that: a. DMI shows no OS acknowledgement request
11	When passing signal 202, verify that: a. DMI shows level is Level 2 b. DMI shows mode according to Table 5.7-13 c. DMI shows movement authority ending at or in advance of signal 204
12	Only scenario 6.4.a: When the train is in rear of signal 204 (less than 100m), verify that: a. DMI shows TAF request b. When driver acknowledges TAF request, DMI shows mode OS until MA without Mode Profile was received from the RBC[22]
13	When receiving National Values for braking curves, verify that: a. for non-System Version 1.1 compatible onboards National Values for braking curves is discarded; other information of the balise groups shall be considered b. for System Version 1.1 compatible onboards: all information of the balise groups shall be considered and the braking characteristics updated

Table 5.7-15 Scenario steps with HSL-South in Level 2

[22] The RBC sends a new MA without Mode Profile if TAF is granted

5.7.5 Exit specialties to ATB

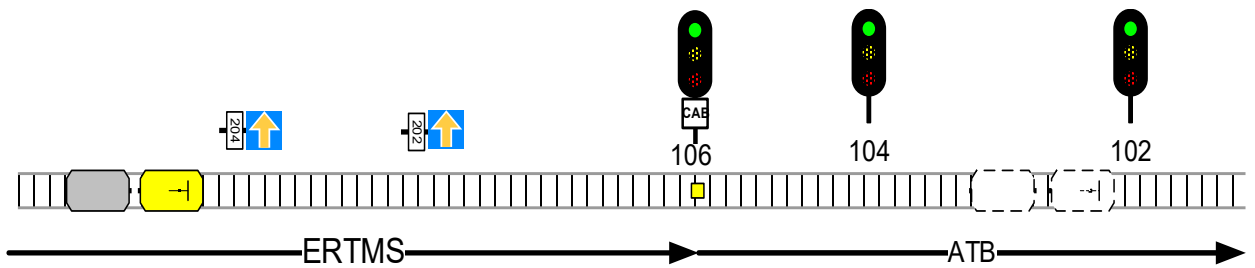This operational scenario contains special exit scenarios.

Figure 5.7-2 Exit situation

Figure 5.7-2 shows the situation of the exit as used. The train starts in rear of signal 204. The Dispatcher sets all routes according Table 5.7-16 Route settings. After all routes are set, the train runs the route following the signals and DMI information. The driver has to operate according the operational rules applicable for the situation.

Scenario	Description	204	202	106	104
6.5a	NORM-ROZ	NORM	NORM	ROZ	NORM
6.5b	ROZ-NORM	NORM	ROZ	NORM	NORM
6.5c	ROZ-ROZ	NORM	ROZ	ROZ	NORM
6.5d	STS-NORM	NORM	NORM	STOP	NORM

Table 5.7-16 Route settings

Scenario	Description	204	202	106	104
6.5a	NORM-ROZ	FS	FS	SN/ATB	SN/ATB
6.5b	ROZ-NORM	FS	OS	SN/ATB	SN/ATB
6.5c	ROZ-ROZ	FS	OS	SN/ATB	SN/ATB
6.5d	STS-NORM	FS	FS	SN/ATB	SN/ATB

Table 5.7-17 Mode after passing signal

Scenarios 6.5a, 6.5b and 6.5c must be performed twice, once with the trackside in Level 1 and once with the trackside in Level 2. Scenario 6.5d must be performed only with trackside in Level 1.

For each scenario the following steps must be performed.

Step	Action / Control
Pre	• level is Level 1 or Level 2 is according to trackside level • mode is according to Table 5.7-17 • route is set according to Table 5.7-16
1	When passing signal 204, verify that: a. DMI shows mode according to Table 5.7-17.
2	Only scenario 6.5b and 6.5c (not for trackside in Level 1): Before passing signal 202, verify that: a. DMI shows braking curve ending at signal 202 with no release speed b. DMI shows an OS acknowledgement request c. When driver acknowledge OS acknowledgement, DMI shows MA extension to signal 106
3	When passing signal 202, verify that: a. DMI shows mode according to Table 5.7-17.

Step	Action / Control
4	Before passing signal 106, verify that: a. DMI shows announcement level transition to Level NTC-ATB[23]
5	When train front end passes start of level acknowledgement window, verify that: a. DMI shows level acknowledgement request b. Driver acknowledges level transition within 5 seconds after passing transition location
6	Only scenario 6.5a: Before passing signal 106, verify that: a. DMI shows braking curve ending at signal 106 with no release speed b. DMI shows an OS acknowledgement request c. When driver acknowledge OS acknowledgement, DMI shows MA extension to signal 104
7	When passing signal 106 (not scenario 6.5d), verify that: a. DMI shows level change to Level NTC-ATB b. DMI shows mode change to mode SN[24] c. DMI shows correct ATB code
8	(not for trackside in Level 1) When termination order is received, verify that: a. DMI shows termination of the RBC connection
9	Only scenario 6.5d: When passing signal 106, verify that: a. DMI shows level change to Level NTC-ATB b. DMI shows mode change to mode TR c. brakes are applied d. when driver acknowledge the Trip, DMI shows mode change to mode SN
10	After passing signal 104, verify that: a. DMI shows correct ATB code

Table 5.7-18 Scenario steps

5.7.6   Override (STS passage)

Use scenario in 5.10.4 Override (STS passage). Cross acceptance with other ESC types is not possible.

5.7.7   Signal passed at danger

Use scenario in 5.10.5 Signal passed at danger. Cross acceptance with other ESC types is not possible.

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[23] Situations can occur where an already announced level transition is repeated from the trackside. The reception of this repeated level transition order may not interfere with the announced level transition order in the case that the contents are similar.
[24] For scenario 6.5b depending on the level transition location and the train confidence interval the DMI shows shortly mode change to mode FS before mode change to SN

5.8 ERTMS Track HSL-South – border Belgium

5.8.1 Confidence run over complete track

This operational scenario is a normal run over the ERTMS track of multiple ESC types in both directions. The dispatcher sets all routes with normal aspects (NORM). The driver shall react on DMI or trackside signals according to normal operations. The driving speed is the maximum allowed speed. There are no special actions required from both dispatcher and driver. The locations of the route are described in Table 5.8-1 Route settings. The start and end locations area described in Table 5.8-2 Start and end locations. For non-leading engines Table 5.8-7 Scenario steps non-leading engine is applicable during the complete operational scenario.

The following trackside configuration must be used:
* HSL-South (Southern section) operates in ERTMS Level 2
* L4 (Belgium) operates in ERTMS Level 2

Id	Route	Route setting
1	Breda (Bd) – Breda aansluiting HSL (Bda)	Bd -> BC -> BB -> SU -> HA1 -> SU
2	Breda aansluiting HSL (Bda) – België Noorderkempen	SU -> SZ1 -> Ndk
3	België Noorderkempen – Breda aansluiting HSL (Bda)	Ndk -> TZ2 -> TU
4	Breda aansluiting HSL (Bda) – Breda (Bd)	TU -> TT -> HB1 -> Bd

Table 5.8-1 Route settings

Id	Location	Start location	End location
1	Breda (Bd) – Breda aansluiting HSL (Bda)	Bd (not specific)	SU
2	Breda aansluiting HSL (Bda) – België Noorderkempen	SU	Ndk (not specific)
3	België Noorderkempen – Breda aansluiting HSL (Bda)	Ndk (not specific)	TU
4	Breda aansluiting HSL (Bda) – Breda (Bd)	TU	Bd (not specific)

Table 5.8-2 Start and end locations

During the execution of the route, the following steps must be performed.

Step	Action / Control
Pre	• Level is Level NTC-ATB • Mode in SN • Route is set from start location 1 to end location 1
1	When receiving the connection establishment order from the balise group, verify that: a. DMI shows connection setup with the RBC (only for onboard with B2)
2	Train is running towards transition signal. When receiving the level transition announcement, verify that: a. DMI shows level transition announcement b. DMI shows connection establishment with the RBC

Step	Action / Control
3	When train front end passes start of level acknowledgement window (not for onboards with B3R2+Art10SP2017), verify that: a. DMI shows level acknowledgement request b. Driver acknowledges level transition within 5 seconds after passing transition location
4	When passing transition location, verify that: a. DMI shows level change to Level 1 b. DMI shows mode change to mode FS c. no brakes applied
5	When onboard receives level transition order to Level 2, verify that: a. DMI shows level transition announcement
6	When passing SMB 2412, verify that: a. DMI shows level change to Level 2 b. DMI shows mode remaining mode FS c. no brakes applied d. DMI shows no braking (pre)-indication
7	When receiving track conditions at voltage change over, verify that: a. DMI shows track condition information (announcement, start and end) at the defined locations b. If applicable the train systems show correct behaviour at the defined locations
8	When train is at end location 1, driver continues next scenario

Table 5.8-3 Scenario steps 1

Step	Action / Control
Pre	• Level is Level 2 • Mode in FS • Route is set from start location 2 to end location 2
1	When passing signal, verify that: a. DMI shows level remaining Level 2 b. DMI shows mode remaining mode FS c. no brakes applied
2	When receiving RBC transition order, verify that: a. DMI shows connection establishment with (handing over[25]) RBC b. When train front end passes RBC transition location, DMI shows connection establishment with (accepting) RBC c. no brakes applied
3	When receiving text message about GSM-R, verify that: a. DMI shows text message
4	When approaching end of route, verify that a. DMI shows braking curve to EoA
4	When train is stopped at end location 2, driver closes desk

Table 5.8-4 Scenario steps 2

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[25] DMI shows only one connection without information to which RBC the connection is established. Some B2 DMI could show 2 connections.

Step	Action / Control
Pre	• Level is Level 2 • Mode in SB • Route is set from start location 3 to end location 3
1	When driver perform Start of Mission procedure, verify that: a. DMI shows level remaining Level 2 b. DMI shows mode change to mode SR
2	When passing signal with balise group, verify that: a. DMI shows level remaining Level 2 b. DMI shows mode change to mode FS c. no brakes applied
3	When passing signals, verify that: a. DMI shows level remaining Level 2 b. DMI shows mode remaining mode FS c. no brakes applied
4	When receiving text message about GSM-R, verify that: a. DMI shows text message
5	When receiving RBC transition order, verify that: a. DMI shows connection establishment with (handing over[26]) RBC b. When train front end passes RBC transition location, DMI shows connection establishment with (accepting) RBC c. no brakes applied
6	When receiving track conditions at phase lock, verify that a. DMI shows track condition information (announcement, start and end) at the defined locations b. If applicable the train systems show correct behaviour at the defined locations
7	When train is at end location 3, driver continues next scenario

Table 5.8-5 Scenario steps 3

Step	Action / Control
Pre	• Level is Level 2 • Mode in FS • Route is set from start location 4 to end location 4
1	When receiving level transition order to Level NTC-ATB, verify that: a. DMI shows level transition announcement to Level NTC-ATB
2	When receiving track conditions at voltage change over, verify that a. DMI shows track condition information (announcement, start and end) at the defined locations b. If applicable the train systems show correct behaviour at the defined locations
3	When the train front end passes the start of the level transition acknowledgement, verify that: a. DMI show level acknowledgement request b. Driver acknowledges level transition within 5 seconds after passing transition location

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[26] DMI shows only one connection without information to which RBC the connection is established. Some B2 DMI could show 2 connections.

Step	Action / Control
4	When passing the level transition location, verify that:
	a. DMI show level change to Level NTC-ATB
	b. DMI shows mode change to mode SN
5	When train is stopped at end location 4, driver closes desk

Table 5.8-6 Scenario steps 4

Step	Action / Control
1	When leading engine desk is open, verify that:
	a. Non-leading cab in mode NL: DMI shows level is according to leading engine (except for distance between engines at transition locations)
	b. Non-leading cab in mode NL: DMI shows mode is mode NL
	c. Non-leading cab in mode SL: DMI is in sleeping state

Table 5.8-7 Scenario steps non-leading engine

5.8.2   RBC Handover with one active modem

This scenario verifies the behaviour of the onboard system in the event of an RBC Handover with only one active modem. For onboards equipped with multiple modems, for this scenario the system must be configured in the sense that only one modem is active.

While the onboard is still connected to the handing over RBC, there are no possibilities to contact the accepting RBC. Once the session with the handing over RBC is terminated, the onboard shall connect with the accepting RBC. The time interval between the termination of the session with the handing over RBC and the successful session establishment of the accepting RBC is a good performance indication. This connection attempt must be successful within T_NVCONTACT.

The following steps must be performed.

Step	Action / Control
Pre	• level is Level 2
	• train is connected with handing over RBC
	• train length is the maximum allowed train length
	• routes are set from handing over RBC into accepting RBC with NORM
1	Train is running[27] from handing over RBC to accepting RBC
2	When the onboard receives an RBC Transition order announcement, verify that:
	a. DMI shows connection establishment with (handing over[28]) RBC
3	When the train front end passes the RBC-RBC border, verify that:
	a. DMI shows connection establishment with (handing over) RBC
4	When the train rear end passes the RBC-RBC border, verify that:
	a. DMI shows connection termination with (handing over) RBC
5	When connection with (handing over) RBC is terminated, verify that:
	a. DMI shows connection establishment with (accepting) RBC within T_NVCONTACT
	b. no brakes applied due M_NVCONTACT reaction

Table 5.8-8 Scenario Steps

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[27] During the handover the maximum speed of the train shall be used to avoid a movement revocation due to time out of the RBC handover without recovery possibilities.
[28] DMI shows only one connection without information to which RBC the connection is established

5.9 ERTMS Track Amsterdam – Utrecht

5.9.1 Confidence run over complete track

This operational scenario is a normal run over the ERTMS track of multiple ESC types in both directions. The dispatcher sets all routes with normal aspects (NORM). The driver shall react on DMI or trackside signals according to normal operations. The driving speed is the maximum allowed speed. There are no special actions required from both dispatcher and driver. The locations of the route are described in Table 5.9-1 Route settings. The start and end locations area described in Table 5.9-2 Start and end locations. For non-leading engines Table 5.9-10 Scenario steps non-leading engine is applicable during the complete operational scenario.

Id	Route	Route setting
1	Utrecht (Ut) – Maarssen (Mas)	NORM: Ut -> AE5/AS4
2	Maarssen (Mas) – Amsterdam Bijlmer (Asb)	NORM: AE5/AS4 -> 601/603
3	Amsterdam Bijlmer (Asb) – Amsterdam (Asd)	NORM: 601/603 -> Asd
4	Amsterdam (Asd) – Amsterdam Bijlmer (Asb)	NORM: Asd -> 606/608
5	Amsterdam Bijlmer (Asb) – Maarssen (Mas)	NORM: 606/608 -> 813b
6	Maarssen (Mas) – Maarssen (Mas)	NORM 813b -> US1/UE1
7	Maarssen (Mas) – Utrecht (Ut)	NORM: US1/UE1 -> Ut

Table 5.9-1 Route settings

Id	Location	Start location	End location
1	Utrecht (Ut) – Maarssen (Mas)	Ut (not specific)	AE5/AS4
2	Maarsen (Mas) – Amsterdam Bijlmer (Asb)	AE5/AS4	601/603
3	Amsterdam Bijlmer (Asb) – Amsterdam (Asd)	601/603	Asd (not specific)
4	Amsterdam (Asd) – Amsterdam Bijlmer (Asb)	Asd (not specific)	606/608
5	Amsterdam Bijlmer (Asb) – Maarsen (Mas)	606/608	813b
6	Maarssen (Mas) – Maarssen (Mas)	813b	US1/UE1
7	Maarssen (Mas) – Utrecht (Ut)	US1/UE1	Ut (not specific)

Table 5.9-2 Start and end locations

During the execution of the route, the following steps must be performed.

Step	Action / Control
Pre	• Level is Level NTC-ATB • Mode in SN • Route is set from start location 1 to end location 1

Step	Action / Control
1	When receiving the connection establishment order from the balise group, verify that: a. DMI shows connection setup with the RBC (only for onboard with B2)
2	Train is running towards transition signal. When receiving the level transition announcement, verify that: a. DMI shows level transition announcement b. DMI shows connection establishment with the RBC
3	When train front end passes start of level acknowledgement window (not for onboards with B3R2+Art10SP2017), verify that: a. DMI shows level acknowledgement request b. Driver acknowledges level transition within 5 seconds after passing transition location
4	When passing transition signal, verify that: a. DMI shows level change to Level 2 b. DMI shows mode change to mode FS c. no brakes applied d. DMI shows no braking (pre)-indication
5	When train is at end location 1, driver continues next scenario

Table 5.9-3 Scenario steps 1

Step	Action / Control
Pre	• Level is Level 2 • Mode in FS • Route is set from start location 2 to end location 2
1	When passing signals, verify that: a. DMI shows level remaining Level 2 b. DMI shows mode remaining mode FS c. no brakes applied
2	When train is at end location 2, driver continues next scenario

Table 5.9-4 Scenario steps 2

Step	Action / Control
Pre	• Level is Level 2 • Mode in FS • Route is set from start location 3 to end location 3
1	When receiving level transition order to Level NTC-ATB, verify that: a. DMI shows level transition announcement to Level NTC-ATB
2	When the train front end passes the start of the level transition acknowledgement, verify that: a. DMI show level acknowledgement request b. Driver acknowledges level transition within 5 seconds after passing transition location
3	When passing the level transition location, verify that: a. DMI show level change to Level NTC-ATB b. DMI shows mode change to mode SN
4	When train is stopped at end location 3, driver closes desk

Table 5.9-5 Scenario steps 3

Step	Action / Control
Pre	• Train direction is changed • Level is Level NTC-ATB • Mode in SN • Route is set from start location 4 to end location 4
1	When receiving the connection establishment order from the balise group, verify that: a. DMI shows connection setup with the RBC (only for onboard with B2)
2	Train is running towards transition signal. When receiving the level transition announcement, verify that: a. DMI shows level transition announcement b. DMI shows connection establishment with the RBC
3	When train front end passes start of level acknowledgement window (not for onboards with B3R2+Art10SP2017), verify that: a. DMI shows level acknowledgement request b. Driver acknowledges level transition within 5 seconds after passing transition location
4	When passing transition signal, verify that: a. DMI shows level change to Level 2 b. DMI shows mode change to mode FS c. no brakes applied d. DMI shows no braking (pre)-indication
5	When train is at end location 4, driver continues next scenario

Table 5.9-6 Scenario steps 4

Step	Action / Control
Pre	• Level is Level 2 • Mode in FS • Route is set from start location 5 to end location 5
1	When passing signals, verify that: a. DMI shows level remaining Level 2 b. DMI shows mode remaining mode FS c. no brakes applied
2	When approaching end of route, verify that a. DMI shows braking curve to EoA
3	When train is stopped at end location 5, driver closes desk

Table 5.9-7 Scenario steps 5

Step	Action / Control
Pre	• Level is Level 2 • Mode in SB • Route is set from start location 6 to end location 6
1	When driver perform Start of Mission procedure, verify that: a. DMI shows level remaining Level 2 b. DMI shows mode change to mode OS c. DMI shows OS acknowledgement request d. Driver acknowledges OS acknowledgement request

Step	Action / Control
2	When passing signal with balise group, verify that: a. DMI shows level remaining Level 2 b. DMI shows mode change to mode FS c. no brakes applied
3	When passing signals, verify that: a. DMI shows level remaining Level 2 b. DMI shows mode remaining mode FS c. no brakes applied
4	When train is at end location 6, driver continues next scenario

Table 5.9-8 Scenario steps 6

Step	Action / Control
Pre	• Level is Level 2 • Mode in FS • Route is set from start location 7 to end location 7
1	When receiving level transition order to Level NTC-ATB, verify that: a. DMI shows level transition announcement to Level NTC-ATB
2	When passing the level transition location, verify that: a. DMI show level change to Level NTC-ATB b. DMI shows mode change to mode SN c. no brakes applied
3	When train is stopped at end location 7, driver closes desk

Table 5.9-9 Scenario steps 7

Step	Action / Control
1	When leading engine desk is open, verify that: a. Non-leading cab in mode NL: DMI shows level is according to leading engine (except for distance between engines at transition locations) b. Non-leading cab in mode NL: DMI shows mode is mode NL c. Non-leading cab in mode SL: DMI is in sleeping state

Table 5.9-10 Scenario steps non-leading engine

5.9.2   Exit when failure NTC-ATB

Use scenario in 5.10.1 Exit when failure NTC-ATB. Cross acceptance with other ESC types is not possible.

5.9.3   Running in OS

Use scenario in 5.10.2 Entering OS. Cross acceptance with other ESC types is not possible.

5.9.4   Entrance specialties from ATB to ERTMS

This operational scenario contains special entrance scenarios. Figure 5.9-1 shows the situation of the entrance as used. The train starts in rear of signal 102 (or one or more signals before to start before the first balise group). The dispatcher sets all routes according to Table 5.9-11. After all routes are set, the train runs the route following the signals and DMI information. The driver has to operate according the operational rules applicable for the situation. The route setting ends at signal 204[29].

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[29] Unless signal 204 is a P-sein and will automatically switch to yellow or green if the track is not occupied.

On Amsterdam - Utrecht tracks the entry transition is completely controlled by the RBC and is depending on position reports of the train.
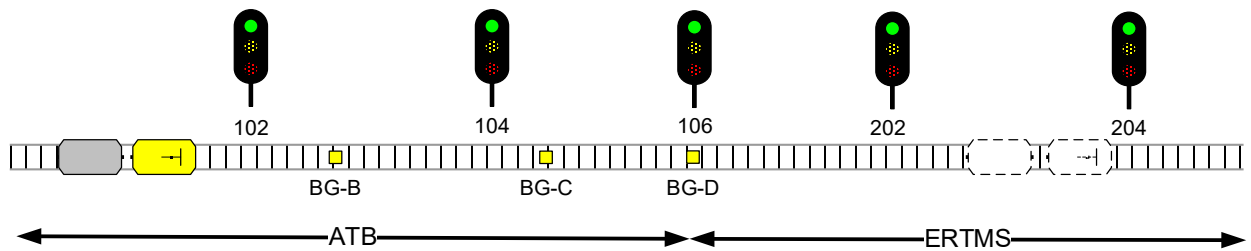

Figure 5.9-1 Entrance situation

Scenario	Description	102	104	106	202
8.4a	NORM-ROZ	NORM	NORM	ROZ	NORM
8.4b	ROZ-NORM	NORM	ROZ	NORM	NORM
8.4c	ROZ-ROZ	NORM	ROZ	ROZ	NORM
8.4d	No transition announcement	NORM	NORM	STOP	NORM

Table 5.9-11 Route settings

Scenario	Description	102	104	106	202
8.4a	NORM-ROZ	SN/ATB	SN/ATB	OS	OS
8.4b	ROZ-NORM	SN/ATB	SN/ATB	FS	FS
8.4c	ROZ-ROZ	SN/ATB	SN/ATB	OS	OS
8.4d	No transition announcement	SN/ATB	SN/ATB	SN/FS	FS

Table 5.9-12 Mode after passing signal

Scenario 8.4d is a special scenario for Amsterdam – Utrecht track about late route setting. In this scenario the entry route is not set (signal 106 STOP). When the train has passed signal 102 and signal 104, the train stops within 50 meters in rear of signal 106. Then the route will be set (signal 106 NORM) by the dispatcher. When the train arrives at signal 106 the RBC will send a transition order accompanied by the movement authority for the entry route. The train has already passed the location of the transition.

For each scenario the following steps must be performed.

Step	Action / Control
Pre	• level is Level NTC-ATB • mode is SN • route is set according to Table 5.9-11
1	When receiving the connection establishment order from the balise group, verify that: a. DMI shows connection setup with the RBC (only for onboard with B2)
2	When passing signal 102, verify that: a. DMI shows correct ATB code
3	When passing signal 104, verify that: a. DMI shows correct ATB code
4	When receiving the level transition announcement (not scenario 8,4d), verify that: a. DMI shows level transition announcement b. DMI shows connection establishment with the RBC

Step	Action / Control
5a	Only scenario 8.4d: Train stops 50m in rear of signal 106. Route from signal 106 is set NORM. When passing signal 106, verify that: a. DMI shows level change to Level 2 b. DMI shows level acknowledgement request (not for onboards with B3R2+Art10SP2017) c. Driver acknowledges level transition within 5 seconds
5b	When train front end passes start of level acknowledgement window (not scenario 8,4d) (not for onboards with B3R2+Art10SP2017), verify that: a. DMI shows level acknowledgement request b. Driver acknowledges level transition within 5 seconds after passing transition location
6	When train front end passes level transition location (not scenario 8,4d), verify that: a. DMI shows level change to Level 2 b. DMI shows no ATB code
7	Only scenario 8.4a and 8.4c: Verify that: a. DMI shows an OS acknowledgement request b. Driver acknowledges OS acknowledgement request
8	When passing signal 106, verify that: a. DMI shows level is Level 2 b. DMI shows mode according to Table 5.9-12
9	Only scenario 8.4a and 8.4c: Before passing signal 202, verify that: a. DMI shows no OS acknowledgement request
10	When passing signal 202, verify that: a. DMI shows level is Level 2 b. DMI shows mode according to Table 5.9-12 c. DMI shows movement authority ending at or in advance of signal 204
11	When receiving National Values for braking curves, verify that: a. for non-System Version 1.1 compatible onboards National Values for braking curves is discarded; other information of the balise groups shall be considered b. for System Version 1.1 compatible onboards: all information of the balise groups shall be considered and the braking characteristics updated

Table 5.9-13 Scenario steps

5.9.5   Exit specialties to ATB

This operational scenario contains special exit scenarios.
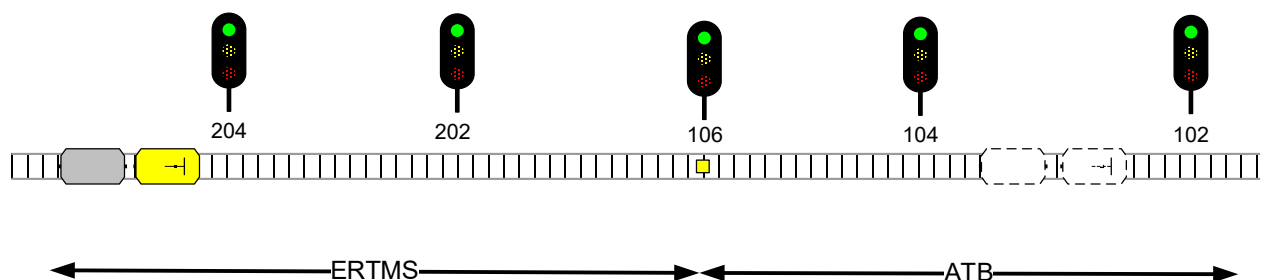

Figure 5.9-2 Exit situation

Figure 5.9-2 shows the situation of the exit as used. The train starts in rear of signal 204. The Dispatcher sets all routes according Table 5.9-14. After all routes are set, the train runs the route following the signals and DMI information. The driver has to operate according the operational rules applicable for the situation.

On the track Amsterdam – Utrecht the exit transition can be at the last controlled signal or the first P-signal of the open line. In the figure above signal 106 is the last controlled signal of the Amsterdam – Utrecht safety system.

Scenario	Description	204	202	106	104
8.5a	NORM-ROZ	NORM	NORM	ROZ	NORM
8.5b	ROZ-NORM	NORM	ROZ	NORM	NORM
8.5c	ROZ-ROZ	NORM	ROZ	ROZ	NORM
8.5d	STS-NORM	NORM	NORM	STOP	NORM

Table 5.9-14 Route settings

Scenario	Description	204	202	106	104
8.5a	NORM-ROZ	FS	FS	SN/ATB	SN/ATB
8.5b	ROZ-NORM	FS	OS	SN/ATB	SN/ATB
8.5c	ROZ-ROZ	FS	OS	SN/ATB	SN/ATB
8.5d	STS-NORM	FS	FS	SN/ATB	SN/ATB

Table 5.9-15 Mode after passing signal

For each scenario the following steps must be performed.

Step	Action / Control
Pre	• level is Level 2 • mode is according to Table 5.9-15 • route is set according Table 5.9-14.
1	When passing signal 204, verify that: a. DMI shows mode according to Table 5.9-15.
2	Only scenario 8.5b and 8.5c: Before passing signal 202, verify that: a. DMI shows braking curve ending at signal 202 with no release speed b. DMI shows an OS acknowledgement request c. When driver acknowledges OS acknowledgement, DMI shows MA extension to signal 106
3	When passing signal 202, verify that: a. DMI shows mode according to Table 5.9-15
4	Before passing[30] signal 106, verify that: a. DMI shows announcement level transition to Level NTC-ATB[31]
5	When train front end passes start of level acknowledgement window[32], verify that: a. DMI shows level acknowledgement request b. Driver acknowledges level transition within 5 seconds after passing transition location
6	Only scenario 8.5a: Before passing signal 106, verify that: a. DMI shows braking curve ending at signal 106 with no release speed b. DMI shows an OS acknowledgement request c. When driver acknowledges OS acknowledgement, DMI shows MA extension to signal 104

[30] At some locations if signal 106 is stop, the DMI does not show the level transition announcement
[31] Situations can occur where an already announced level transition is repeated from the trackside. The reception of this repeated level transition order may not interfere with the announced level transition order in the case that the contents are similar.
[32] At some locations if signal 106 is stop, the DMI shows level acknowledgement request only when passing signal 106

Step	Action / Control
7	When passing signal 106, verify that:
	a. DMI shows level change to Level NTC-ATB
	b. DMI shows mode change to mode SN[33]
	c. DMI shows correct ATB code
8	When termination order is received, verify that:
	DMI shows termination of the RBC connection.
9	Only scenario 8.5d: When passing signal 106, verify that:
	a. DMI shows level change to Level NTC-ATB
	b. DMI shows mode change to mode TR
	c. brakes are applied
	d. when driver acknowledges the Trip, DMI shows mode change to mode SN
10	When passing signal 104, verify that:
	a. DMI shows correct ATB code

Table 5.9-16 Scenario steps

5.9.6   Movement revocation

Use scenario in 5.10.3 Movement revocation. Cross acceptance with other ESC types is not possible.

5.9.7   Override (STS passage)

Use scenario in 5.10.4 Override (STS passage). Cross acceptance with other ESC types is not possible.

5.9.8   Signal passed at danger

Use scenario in 5.10.5 Signal passed at danger. Cross acceptance with other ESC types is not possible.

5.9.9   Change direction

Use scenario in 5.10.6 Change direction. Cross acceptance with other ESC types is not possible.

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[33] For scenario 8.5b depending on the level transition location and the train confidence interval the DMI shows shortly mode change to mode FS before mode change to SN.

5.10 Generic scenarios

This paragraph contains operational scenario that are applicable for more than one ESC type and use the same operational scenario. The actual outcome depends however on the ESC type under test.

5.10.1 Exit when failure NTC-ATB

This operational scenario is a normal run when the NTC-ATB is in failure and not isolated. Due to the failure of the NTC the driver is not able to make a dynamic transition from ETCS to ATB.

The following steps must be performed.

Step	Action / Control
Pre	• NTC-ATB is in failure and not isolated, i.e. Level NTC-ATB is not selectable • level is the applicable level valid for the ERTMS trackside • routes are set passing the exit of the ERTMS area
1	Train is running towards exit of ERTMS area. Verify that: a. DMI shows mode is mode FS b. DMI shows a message indicating the unavailability of the NTC-ATB[34]
2	When receiving level transition order to Level NTC-ATB, verify that a. DMI shows level transition announcement to Level NTC-ATB
3	Verify that: a. DMI shows MA ending at the level transition location b. DMI shows braking curve
4	When passing the level transition location, verify that: a. brakes are applied b. DMI shows level change to Level NTC-ATB c. DMI shows mode change to mode SN

Table 5.10-1 Scenario steps

5.10.2 Entering OS mode profile

This operational scenario is an entering of a OS mode profile. The test must be performed with the brake parameters and characteristics the train may have when it is used in normal operation with maximum length and weight, and minimum brake force.

The following steps must be performed.

Step	Action / Control
Pre	• level is the applicable level valid for the ERTMS trackside • route is set with NORM followed by route set with ROZ
1	Train is running towards route set with On Sight. Verify that: a. DMI shows mode is mode FS.
2	When receiving movement authority with mode profile OS a. DMI shows MA with an End of Authority at the start of the OS mode profile with no release speed
3	When passing start of the OS acknowledgement window and when the speed is below OS permitted speed, verify that: a. Start of OS acknowledgement window can be reached with 40 km/h or a reasonable speed b. DMI shows an OS acknowledgement request

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[34] Depending on onboard implementation this message is displayed at the startup of the system or when the level transition order is received. The message could be displayed a certain amount of time and could not be shown again.

ETCS System Compatibility (ESC)

Step	Action / Control
4	When driver acknowledge OS acknowledgement request, verify that a. DMI shows mode change to mode OS b. DMI shows MA extension in advance of start of OS mode profile

Table 5.10-2 Scenario steps

5.10.3 Movement revocation

This operational scenario consists of 2 sub scenarios; the scenario where the train can stop in rear of the signal and the scenario where the train cannot stop in rear of the signal.

This scenario assumes that a route has been set, containing at least two (or more blocks). Route revocation makes only sense if the route that is revoked involves the blocks in front of the train (and not the block occupied by the train) and the route has been received by the train.

For tracksides where cooperative route revocation is implemented, the sequence is as follows:

a. Dispatcher revokes the route
b. RSMA message is sent to a moving[35] train and response is validated
c. Based on response the route release is direct or delayed

The following steps must be performed.

Step	Action / Control
Pre	• level is Level 2 • mode is FS • route is set containing at least 2 blocks
1	Dispatcher revokes the last route and RBC sends request to shorten MA and a shortened MA[36]
2a	When with the proposed EoA the train front end of the train is in advance of the new indication (for onboard with B3MR1: pre-indication) point, verify that: a. DMI shows MA shortening to start of revoked route
2b	When with the proposed EoA the train front end of the train is in rear of the new indication (for onboard with B3MR1: pre-indication) point, verify that: a. DMI shows MA shortening to start of revoked route
3a	When train can stop in rear of signal, verify that: a. DMI shows mode remaining mode FS
3b	When train is not able to stop in rear of signal, verify that: a. brakes are applied b. when the train front end of the train has passed the signal the mode, DMI shows mode change to mode TR

Table 5.10-3 Scenario steps

5.10.4 Override (STS passage)

This operational scenario is used when the driver has to pass a signal at stop using function to override End of Authority.

The following steps must be performed.

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[35] When the train is at standstill, the RBC immediately concludes that route can be released and will inform the IXL to release the route.
[36] The request to shorten MA and the shorten MA are sent consecutively with a configured delay independent on the response of the request to shorten MA. The sequence itself is trackside dependent.

Step	Action / Control
Pre	• level is Level 2 • mode is FS • route is set to next signal
1	Train is in running towards end of route. Verify that: a. DMI shows MA with EoA at next signal
2	Train is stopped before the end of route where a balise group is placed with Stop-If-In-SR
3	When the driver selects the Override function, verify that: a. DMI shows that Override function is active b. speed is supervised at V_NVSUPOVTRP
4	When the train passes end of route within T_NVOVTRP, verify that: a. DMI shows mode is mode SR b. no brakes applied c. speed is supervised at V_NVSTFF

Table 5.10-4 Scenario steps

5.10.5 Signal passed at danger

This operational scenario is used when the driver passes an EoA in release speed.

The following steps must be performed.

Step	Action / Control
Pre	• level is the applicable level valid for the ERTMS trackside • mode is FS • route is set to next signal
1	Train is in running towards end of route. Verify that: a. DMI shows MA with EoA at next signal
2	Train reduce speed to below the release speed. When approaching end of route, verify that: a. DMI shows mode is mode FS b. DMI shows permitted speed reducing to zero c. DMI shows allowed release speed d. no brakes applied
3	When the train front end passes EoA at end of route, verify that: a. DMI shows mode change to mode TR b. brakes applied
4	When driver acknowledges the trip, verify that: a. DMI shows mode change to mode PT b. brakes can be released c. standstill is supervised
5	When driver requests start, verify that: a. DMI shows mode change to mode OS or SR

Table 5.10-5 Scenario steps

5.10.6 Change direction

This operational scenario is used when the driver stops at end of a route, changes direction and receives an MA with a shifted location reference.

The following steps must be performed.

Step	Action / Control
Pre	• level is Level 2 • mode is FS • route is set to next signal
1	Train is in running towards end of route. Verify that: a. DMI shows MA with EoA at next signal
2	When train is stopped at end of route, driver closes desk and changes direction by opening other desk
3	Route is set from signal in advance of train to next signal
3	When start of mission is performed, verify that: a. DMI shows mode change to mode OS b. DMI shows OS acknowledgement request c. Driver acknowledges OS acknowledgement request
4	When passing signal, verify that: a. DMI shows mode change to mode FS b. No brakes applied

Table 5.10-6 Scenario steps

6   Error Correction Change Requests and non-compliances

6.1.1   General

The European Rail Traffic Management System (ERTMS) is a complex software-based system that needs constant monitoring, update and upgrading. In its capacity as System Authority for the ERTMS, the Agency has set up a change control management system for the ERTMS specifications, involving the Sector organisations, in order to collect feedback from the implementation of the system.

The findings originating from those feedback and return of experience are logged in the database of Change Requests (CR), according to Article 28 of the Regulation (EU) 2016/796 of the European Parliament and of the Council of 11 May 2016 on the European Union Agency for Railways and repealing Regulation (EC) No 881/2004' ("the Agency Regulation").

The Agency, in collaboration with the experts of the Sector organisations, carries out the analysis and assessment of the CR in the database that can be considered as errors in the system specifications, with a view to identify those errors which could prevent the system to provide normal service. The result of this work is either included in an update / new Set of Specifications as part of the TSI CCS or published as an ERA Opinion with the aim to include it in a future update / new Set of Specifications as part of the TSI CCS.

An ERTMS vehicle which is authorised against one of the Sets of Specifications of the TSI CCS, is assumed to be fully compliant with this Set of Specifications and is therefore assumed to be fully compliant with the error corrections included in this Set of Specifications.

However, an ERTMS vehicle which is authorised against one of the Sets of Specifications of the TSI CCS is not necessarily compliant with onboard the error corrections, impacting the functionality of that Set of Specifications, which have been published in a following Set of Specification and/or ERA Opinion. Since these errors can prevent the system to provide a normal service, a compatibility impact analysis with the ERTMS infrastructure must be carried out

6.1.2   Method

The Applicant has to list:

a. All error correction as resolved in the ERA CCM process and included in the Set of Specifications used for the authorisation of the vehicle but which the vehicle is not compliant with (this list shall be empty)

b. All error correction published after the Set of Specifications used for the authorisation of the vehicle (either by new/updated Set(s) of Specifications or Opinion(s)), impacting the functionality of that Set of Specifications.

And in addition:

c. All non-compliances to the Set of Specifications used for the authorisation of the vehicle, exported constraints, limitations for use etc.

     o   E.g. The Dutch ERTMS track sides have been designed considering the performance requirements of Subset-041 "Performance Requirements for Interoperability". The values of the onboard performance requirements have been used as ultimate limits in the design of the track side (i.e. during nominal operation performance is expected to be well below these ultimate limits). Furthermore, the conditions of the state "malfunctioning" of the onboard odometry and measured are not specified in the Subset-041. The applicant must list all conditions (values, expected frequency and MTBF) for deviations of the performance requirements. Note other deviations on the ultimate limits in the performance specification shall of course be reported.

For all the above-mentioned error corrections, the applicant has to state whether the vehicle is fully compliant with the error correction. For the error correction(s) with which the vehicle is not fully compliant, the Applicant has to describe the onboard behaviour regarding the error(s). In case the

Applicant is not able to describe the onboard behaviour regarding these non-compliances, the onboard behaviour shall be demonstrated by a test scenario.

For all the above mentioned non-compliances, an impact analysis in combination with concerned ESC trackside type must be carried out. This shall cover the safety and operational impact.