Train Control
ETCS sys

ETCS System Compatibility
French Borders

Document Management

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History

Author	Version	Date	§ Adapted	Reason
T. Destrée	1.1 draft 1	19/07/2022	/	Creation of the document
T. Destrée	1.1	12/10/2022	§3.6	Description of the border adapted. Major version.

Abrogated documents

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1. Introduction

1.1 Purpose of the document

The purpose of this document is to define the test scenarios to perform to prove the ETCS System Compatibility (ESC) between the On-board and the trackside at the Infrabel network borders with France.
This document is an annexe of [6].

1.2 Basic documents

Ref.	*Title*	*Owner*
[1]	PSI (TC,ETCSsys,z) ESC TST PLN 1.4	Infrabel
[2]	Masterplan ETCS and IL 1.1 - Visie 2025 - Situatie ETCS	Infrabel
[3]	PSI (TC,ETCSsys,L94, Ath-Baisieux) Description technique 1.6 F	Infrabel
[4]	PSI (TP,ETCSsys.L1LS,L96 Mons-Quévy) Description technique 1.1 F	Infrabel
[5]	20-3E031-RaiC_FSS24-21 FR-BE-MSM_vI	SNCF

1.3 Reference documents

Title		*Owner*
[6]	PSI (TC, ETCSsys,z) Borders ESC TST DSC 1.3	Infrabel

1.4 Annexes

Ref.	*Title*	*Owner*
[7]	None	

1.5 Scope

This document is applicable for all trains that would run under the protection of ETCS on lines close to the French border of the Infrabel network.

1.6 Definitions, symbols and abbreviations

BG	Balise Group
DMI	Driver Machine Interface
ESC	ETCS System Compatibility
ETCS	European Train Control System
FS	Full Supervision
KVB	Contrôle de Vitesse par Balise
LS	Limited Supervision
NTC	National Train Control
RPS	Répétition Ponctuelle des Signaux
SBG	Signal Balise Group
STM	Specific Transmission Module
TSI	Technical Specification for Interoperability
VBC	Virtual Balise Cover

1.7 Known imperfections

This version does not contain the test descriptions for borders on lines 75 and 130A. Descriptions and tests for those lines will be completed in future releases.

2. On-board Equipment

Out of scope of railway manager Infrabel.

3. Lines crossing the French border

3.1 *L1*

Out of scope, this border is not equipped with ETCS.

3.2 *L75*

This border is planned to be equipped with ETCS1 FS, test description to be defined.

3.3 *L94*

This border is equipped with ETCS1 FS on the Belgian side and STM (KVB, RPS) on the French side. In each direction, the technical solution of the transitions is like transitions with TBL1+ used inside the Infrabel network and tested in ESC_TR_12 and ESC_TR_15 (See [1]).
No specific ESC test cases are required.

3.4 *L96*

Line 96 is equipped with ETCS1 LS (and TBL1+) in Belgium and KVB (and crocodiles) in France. The transition to KVB is composed of an execution BG and an announcement BG (BG E and BG A) like the transitions to STM used in Belgium, but the levels of the P41 are modified and national values are sent (Figure 1: L96 to France).

This border is planned to be equipped with ETCS1 FS, test description to be defined.

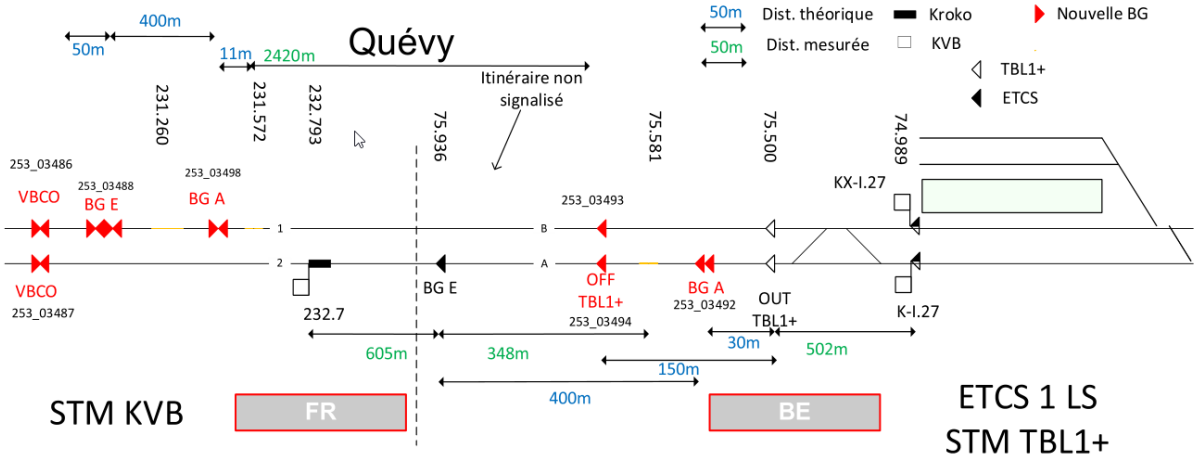

Figure 1: L96 to France

The transition to Belgium (Figure 2 : L96 to Belgium) is composed of::

- A BG sending a virtual balise cover order (VBCO).
- Two BG's for the transition to STM TBL1+. The packet 200 is sent in each balises of the BG A and BG E to inhibit the transition for Baseline 3 trains (red BG A and BG E).
- A BG announcing the transition to level 1 Limited Supervision (Ann_L1).
- The SBG of the first Belgian signal sending the execution of the transition to Level 1 LS with the corresponding MA (SBG of B771 and mx-i.27).

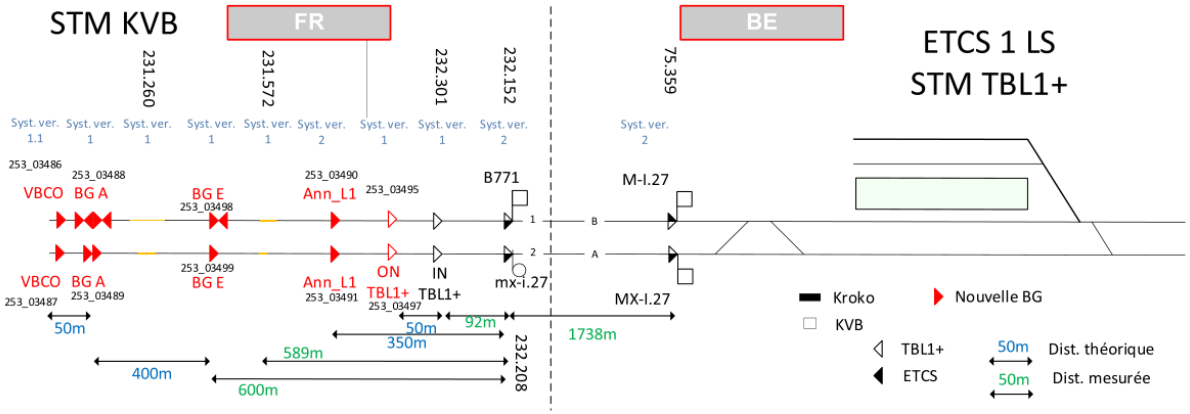

Figure 2 : L96 to Belgium

The border can be tested according to the test cases ESC_borderL96_1, ESC_borderL96_2 and ESC_borderL96_3 described in chapter 0.

3.5 *L130A*

This border is planned to be equipped with ETCS1 LS, test description to be defined.

3.6 *165/2 and 165/3*

This border is equipped with ETCS1 FS on both French and Belgian sides. In each direction, the train is supervised by a FS MA with a change of national values.
No specific ESC test cases are required.

4. Test scenarios

4.1 *ESC_BorderL96_1*

4.1.1 Description

ID	Date	Location / Line
	<dd/mm/yyyy>	Line 96
Description	Transition to ETCS1 LS **for Baseline 3 train** (From France to Belgium) This test is not applicable to Baseline 2 trains for which ESC_BorderL96_2 is applicable.	

Signal passed	
Name	Trackside datafile in service
B771 : first Belgian signal.	

Test Scenarios	
Starting condition	Train is in the station of Maubeuge in the NTC_XXX. NTC_XXX is the NTC allowed in France. It can be in order of priority: KVB or RPS.
	All signals are open.
	Be sure all authorizations are filled in before performing the test scenarios

Sequences of the test scenario

Step	Step description	Description of what to be tested	Statement	Comment
1	Train starts in direction of Belgium and passes the VBCO BG (253_03486).	a. Train remains in level NTC_XXX b. modem is registered to the Belgian network	Pass / Fail	
2	Train passes BG_A and BG_E, the transition BG's to TBL1+ (253_03488, 253_03498)	a. Train remains in level NTC_XXX b. No brakes are applied	Pass / Fail	
3	Train passes the Ann_L1, ON TBL1+ and IN_P44 BG. (253_03490, 253_03495, 253_15080)	a. DMI announces a level transition to Level 1. b. Train remains in level NTC_XXX. c. No brakes are applied	Pass / Fail	
4	Driver acknowledges the transition to level 1.	a. Train remains in level NTC_XXX b. No brakes are applied.	Pass / Fail	
5	Train passes the signal B771.	a) Train changes to ETCS1 Limited Supervision.	Pass / Fail	

		b) No brakes are applied.		
Test scenario finished				

4.1.1 Scenario diagram

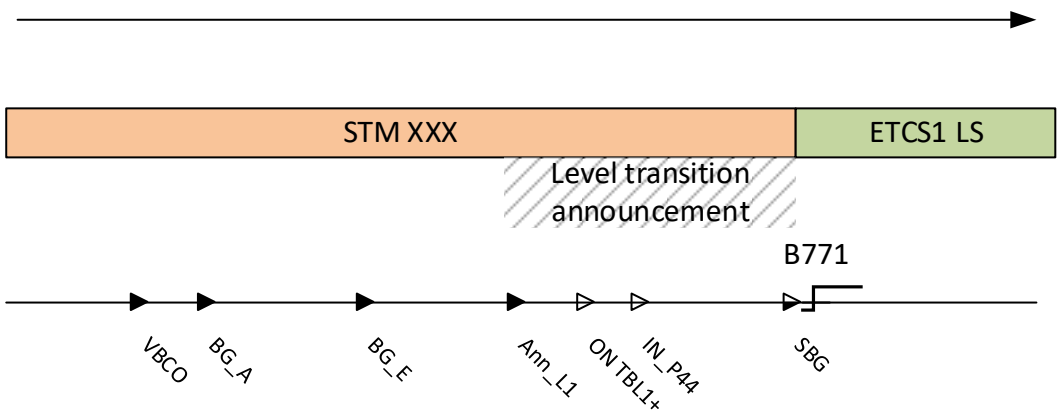

Figure 3 : L96 to Belgium

Final State	Train is in ETCS1 LS downwards B771

4.2 *ESC_BorderL96_2*

4.2.1 Description

ID	Date	Location / Line
ESC_BorderL96_2	<dd/mm/yyyy>	Line 96
Description	Transition to ETCS1 LS **for Baseline 2 train** (From France to Belgium) This test is not applicable to Baseline 3 trains for which ESC_BorderL96_1 is applicable.	

Signal passed	
Name	Trackside datafile in service
B771 : first Belgian signal	

Test Scenarios	
Starting condition	Train is in the station of Maubeuge in the Level STM_XXX. STM_XXX is the STM allowed in France. It can be in order of priority: KVB or RPS.
	All signals are open.
	Be sure all authorizations are filled in before performing the test scenarios

Sequences of the test scenario				
Step	Step description	Description of what to be tested	Statement	Comment
1	Train starts in direction of Belgium and passes the VBCO BG (253_03486).	a. Train remains in level STM_XXX b. modem is registered to the Belgian network	Pass / Fail	
2	Train passes BG_A (253_03488)	a. Train remains in level STM_XXX b. DMI display the announcement to STM_TBL1+ and request acknowledgement. c. No brakes are applied	Pass / Fail	
3	Driver acknowledges the transition to STM TBL1+.	a. Train remains in level STM_XXX b. No brakes are applied.	Pass / Fail	
4	Train passes BG_E (253_03498)	a. Train changes to level STM_TBL1+ b. No brakes are applied.	Pass / Fail	
5	Train passes the Ann_L1 (253_03490).	a. Train remains in level STM_TBL1+ b. No brakes are applied.	Pass / Fail	
6	Train passes the ON TBL1+ and IN_P44 BG. (253_03495, 253_15080)	a. TBL1+ activates in mode NCV.	Pass / Fail	
7	Train passes the signal B771.	a) Train continues in level STM TBL1+.	Pass / Fail	

		b) No brakes are applied.		
Test scenario finished				

4.2.2 Scenario diagram

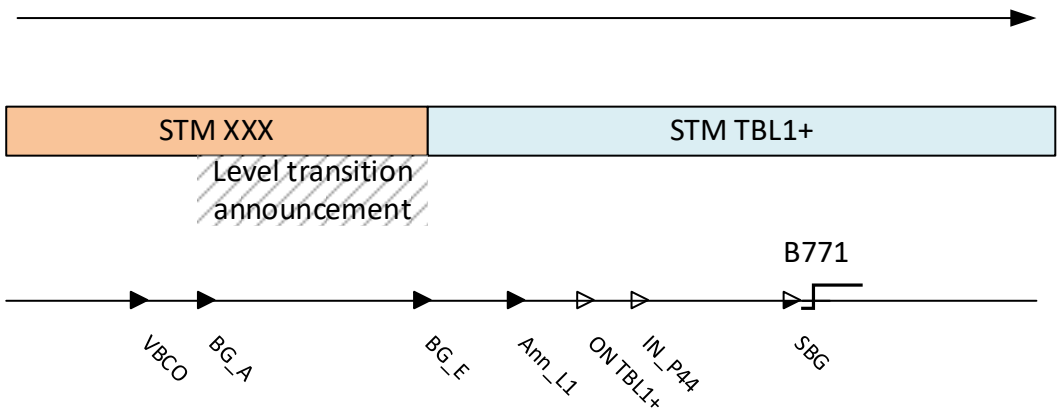

Figure 4 : L96 to Belgium

Final State	Train is in level STM TBL1+ downwards B771

4.3 *ESC_BorderL96_3*

4.3.1 Description

ID	Date	Location / Line
ESC_BorderL96_3	<dd/mm/yyyy>	Line 96
Description	Transition Level_YYY to STM_XXX (From Belgium to France) This test is applicable for Baseline 2 and Baseline 3 trains.	

Signal passed	
Name	Trackside datafile in service
K-I.27 : Last Belgian signal.	
232.7: First French signal	

Test Scenarios	
Starting condition	Train is in the station of Quevy in Level_YYY. • Level_YYY is the Level allowed in Belgium. It can be ETCS1 LS for Baseline 3 trains and STM_TBL1+ for Baseline 2 trains. • NTC_XXX is the NTC allowed in France. It can be in order of priority: KVB or RPS.
	All signals are open.
	Be sure all authorizations are filled in before performing the test scenarios

Sequences of the test scenario				
Step	Step description	Description of what to be tested	Statement	Comment
1	Train passes the signal K-I.27 and OUT_P44 BG.	a) Train continues in Level_YYY b) No brackes are applied.	Pass / Fail	
2	Train passes the BG_A (253_03492).	a) Train remains in Level_YYY b) DMI display the announcement to NTC_XXX and request acknowledgement. c) National values are updated on board with the French national values. d) No brakes are applied	Pass / Fail	
3a[1]	Train passes OFF_TBL1+ (253_03494).	a) Train remains in Level_YYY.	Pass / Fail	
3b	Driver acknowledges the level transition.	a) Train remains in Level_YYY.	Pass / Fail	
4	Train passes BG_E (255_00050).	a) Train changes to level NTC_XXX	Pass / Fail	
5	Train passes signal 232.7.	a) Train remains in level NTC_XXX b) Train reads the crocodile.	Pass / Fail	

[1] 3a and 3b steps could be freely interchanged.

6	Train passes VBCO BG (253_03487).	a) Train remains in level NTC_XXX b) The French national values are used onboard.	Pass / Fail	
Test scenario finished				

4.3.2 Scenario diagram

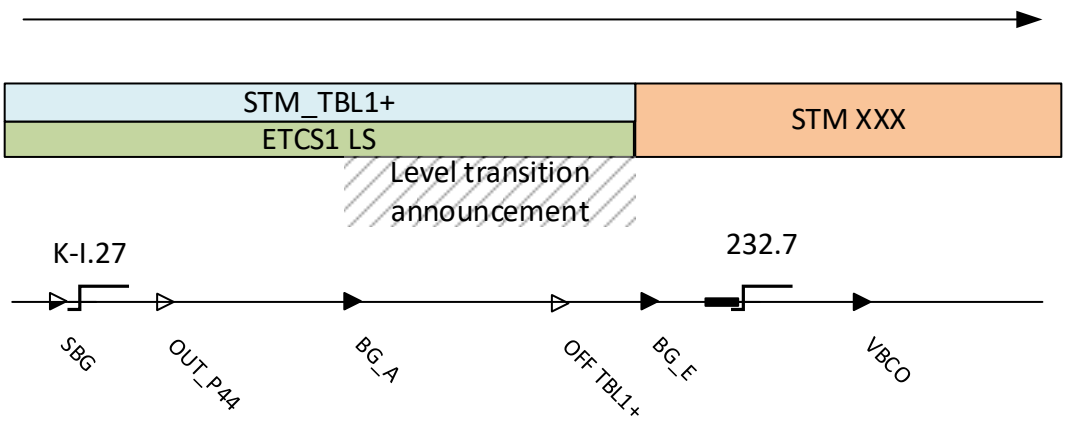

Figure 5 : L96 to France

Final State	Train is in STM_XXX downwards 232.7