

ERTMS UNIT	
TRACEABILITY OF CHANGES TO ETCS FRS	
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TRACEABILITY OF CHANGES TO ETCS FRS

AMENDMENT RECORD

Version	Date	Section number	Modification/description	Author
0.1	30/03/07	all	First Draft	AC; DL
1.0	21/06/07		Official release	AC; DL

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1. INTRODUCTION

1.1. SUBJECT

- 1.1.1. This document describes the changes from ETCS FRS version 4.29 to version 5.0.
- 1.1.2. Version 5.0 of the ETCS FRS is consistent with version 2.3.0 of the ETCS SRS.

1.2. FIELD OF APPLICATION

- 1.2.1. The scope of this document is the justification of the modifications of the ETCS FRS.
- 1.2.2. Note: the need for some formal improvements of the FRS has been found, that should have prejudiced the traceability with the ETCS SRS version 2.3.0 (e.g., important changes in the statements numbering). It has therefore been decided to postpone such improvements to the release of ETCS FRS that will be consistent with version 3.0.0 of ETCS SRS; this is indicated in the column “Final decisions” of the tables in chapter 4.

1.3. DOCUMENT DESCRIPTION

- 1.3.1. Chapter 3 indicates the “general” changes made to the wording of FRS version 4.29, with the scope of improving the quality of the document.
- 1.3.2. These changes apply to several statements and are editorial; they neither modify the meaning of the sentences nor introduce new concepts
- 1.3.3. Chapter 4 contains a detailed list of all modifications (differences between ETCS FRS version 5.0 and version 4.29) that cannot be considered purely editorial.
- 1.3.4. For each modification the reason is explained, together with a short summary of the discussion in the WG that has performed the revision, to justify the final decision.

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2. REFERENCES, TERMS AND ABBREVIATIONS
2.1. REFERENCE DOCUMENTS

Table 1 : Reference documents

Ref. N°	Document Reference	Title	Last Issue
[1]	ERTMS/ETCS V4.29	ERTMS/ETCS FRS	4.29
[2]	ERA_ERTMS_003204	ERTMS/ETCS FRS	5.0
[3]	99E53620	ERTMS/ETCS Functional Statements	2.00
[4]	SUBSET-026	ETCS SRS	2.3.0

2.2. TERMS & ABBREVIATIONS

Table 2 : Abbreviations

Abbreviation	Definition
CCM	Change Control Management
DMI	Driver Machine Interface
FRS	Functional Requirements Specification
MMI	Man Machine Interface
SRS	System Requirements Specification
WG	Working Group

3. GENERAL EDITORIAL MODIFICATIONS

- 3.1. Several changes have been performed to improve the quality of the specification, without neither modifying the meaning of the statements nor adding requirements.
- 3.2. Such modifications are not individually indicated in the lists of chapter 4.
- 3.3. The modifications are the following:
 - (a) All explanations have been deleted
 - (b) All sections “Input / Output” have been deleted
 - (c) The term “must” have been changed to “shall”
 - (d) The acronym “MMI” has been changed to “DMI”

4. FUNCTIONAL MODIFICATIONS

4.1. The following table summarises all changes that have been done to ensure consistency of ETCS FRS with ETCS SRS version 2.3.0.

Clause	Problem	Comments	Final decision
1.1	Add explanations about the scope of this version of the FRS (compliance with SRS 2.3.0)		Add explanations about the scope of this version of the FRS (compliance with SRS 2.3.0)
1.2	Repetition of 1.1.		Deleted
1.3	Not applied in this version of the FRS		Deleted Consider for 3.0.0
1.4	The classification of functions is defined in 1.5		deleted
1.5	Improve definition of functions classification		Updated according to the agreed classification of the functions.
1.6, 1.7, 1.8	Not necessary	it is a repetition of the history.	Deleted
3.1	editorial Delete "method of"		Delete "method of"
3.1.1.1	Editorial and clarification		Split in three separate requirements. 3.1.1.1a: "ETCS shall provide the driver with information to allow him to drive the train safely" 3.1.1.1 b "ETCS shall be able to supervise train movement and shunting movements" 3.1.1.1c: "If the supervision is performed by a RBC it shall be possible to prevent movements of a traction unit in its area if not authorised by the RBC"
3.1.1.2 to 3.1.1.9 and 3.1.1 11	editorial		Delete
3.2	editorial		Modify: "Application levels"
3.2.1.1 and 3.2.1.2	editorial		Delete

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Clause	Problem	Comments	Final decision
3.2.1.3	Wording not appropriate	Improve the wording	<p>Split in 4 separate requirements.</p> <p>Text improved for clarification: “The following definitions shall apply for the ETCS application levels”</p> <p>Definition of level 0 included, referring to the requirements for ETCS applicable in this level.</p> <p>Option to install more ETCS levels on a line</p> <p>Trackside train detection optional for Level 3</p> <p>Clarification about in-fill for 3.0.0</p>
3.2.1.4	Not in 2.3.0		deleted
3.2.1.5	Add requirement for acknowledgment of level transitions		Add requirement for acknowledgment of level transitions
3.3, 3.4, 3.5	not functional requirements		Deleted
3.6	This chapter contains requirements which are not functional requirements. These issues are covered by other documents in the TSI annex A. (SUBSET-041 and SUBSET-091)		Delete
3.7.1.1	Actually, the requirement should say that ETCS shall work independent of National systems	<p>what the requirement here is? It could be read as to require ETCS to work with all national systems (STMs?) or it could be an EMC type compatibility issue?</p> <p>The list of national system is here not defined and therefore the ETCS could not be guaranteed as compatible and not interfere with external elements (national system’s devices) that are not specified.. Suggested to delete or to mitigate like “care shall be taken that..” but this is not testable.</p>	Added: “...listed in the CCS TSI...”.
3.7.1.2 and 3.7.1.3	technical solution, not a requirement.		Deleted

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Clause	Problem	Comments	Final decision
3.8	Duplication of 4.1.1		deleted
3.9	Editorial		Delete "Transition between"
3.9.1.1	Not all statuses are functional requirements. Some are introduced in the SRS for technical needs.	<p>Improve the wording.</p> <p>We face the problem that, for example, the operational mode "on sight" is totally different from the technical mode "On Sight". We could go back to the original expression "Partial Supervision", but then we have problems to specify the requirements later on.</p>	<p>Modify: "The ETCS trainborne equipment shall be capable of supervising the following operational states".</p> <p>Clarify the list of states.</p> <p>Clarification in the glossary for 3.0.0.</p>
3.9.1.2 c	Clarify requirements for STM operation		<p>Wording improved.</p> <p>to be reconsidered with 3.0.0.</p>
3.9.1.2d	JR issue		<p>Move to 4.3.10.</p> <p>Use this statement to complete the requirements for STM operation.</p> <p>TBD - requirements on ack must be clarified</p>
3.9.1.2e	Additional requirement for acknowledgement of transitions		Add: "In case the transition has to be acknowledged and the driver fails..."
3.9.1.3	The word "states" at the end of the clause should be singular, not plural.	Delete the last "s".	Delete the last "s"
3.9.1.4 and 3.9.1.5	Add requirements for multiple level applications		Add requirements for multiple level applications
3.9.1.6	Add requirement for DMI		Add requirement for DMI
3.10.1.1	Bad wording		Modify: "The ETCS onboard shall be capable of receiving National Values from the trackside to adapt to national requirements"
3.10.1.2	To say that the infra manager shall send National Values whenever it is required by himself is not a functional requirement to ERTMS but a tautology.	Delete the clause	delete

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Clause	Problem	Comments	Final decision
3.10.1.3 a and b	technical solution, not a requirement. Rerword.		Replace the clauses with: "National Values shall be applicable to a defined area (M)"
3.10.1.4	Not a functional requirement.	Delete	delete
3.10.1.5	Technical solution, not a requirement.		Delete
3.10.1.6	Add requirement for national values in case of switching off the ETCVS on-board		Add requirement for national values in case of switching off the ETCVS on-board
3.11	Unclear. Several types of variables may have default values.		Modify: "Default values for the national values"
3.11.1.1	Split in two separate requirements	Change 3.11.1.1 to "If the on-board national values are not valid for the current location..." Split in two sentences.	Split in two separate requirements. Modify 3.11.1.1a: "If the on-board has no valid national values for the current location..."
4.1.1	This function is about self test, not about start up.	Modify "start up and" by "self". The only functional requirement is to inform the driver when the system is not operational	Modify: "On-board equipment self-test"
4.1.1.1	This is not a functional requirement but a safety requirement, covered already by other TSI documents. Compare also 3.6.	Delete the clause	delete
4.1.1.2	technical		delete
4.1.1.3a	editorial		Text improved
4.1.1.3b	technical		delete
4.1.1.4a	technical		delete
4.1.1.4c	Not consistent with SRS230		Modify "successful completion" by "the result".
4.1.1.4d to 4.1.1.10d	technical		delete
4.1.2.1a	also UN		Modify: "...before the on-board equipment allows train movements"
4.1.2.1b and c	repetition		delete
4.1.2.3b	Function in SRS300		delete
4.1.2.4	Not in 230 and not in 300	Delete	delete

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Clause	Problem	Comments	Final decision
4.1.2.5 a	Data entry from a train management system is an option. This statement is a repetition of other statements, with the additional concept of data stored in on-board memory. We should also say here that data can be entered by "on-board systems"	this is "M" but there is "may"	Modify: "Train data may be entered automatically from a railway management system or from train memory. (O) "
4.1.2.5 b and c	Not in 230 but maybe in 300		delete
4.1.2.6a, b and c	Not in 230 but maybe in 300		delete
4.1.2.7a, c	Not in 230 but maybe in 300		delete
4.1.2.7 b	duplication of 4.1.2.7.13		delete
4.1.2.8 a, b, c	Is this consistent with 230 ?		delete
4.1.2.12	Not in 230 but maybe in 300		delete
4.1.2.13	Item j) in SRS230 clause 3.18.3.2 qualifies. Therefore it should be M	O > M clarify "...other train systems connected to ETCS". The second sentence is an explanation.	O > M And modify "...required by STMs connected to ETCS".
4.1.2.14a	Should is not appropriate	Should > shall modify "selection of the language shall be possible". (driver ID is in 4.1.2.16)	Should > shall and modify "selection of the language shall be possible" TBD for 3.0.0: when should be possible? Always? At standstill? ...
4.1.2.14b	Not in 230 but maybe in 300	no, it is already 230, but delete "at any time".	Modify: "...shall be possible (M)"
4.1.2.15	The driver cannot select partial supervision		Reword: driver shall be able to perform shunting or train movement
4.1.2.16	Add list of data to be entered by driver.		Modify: "The following data may be entered manually by the driver or from train memory (M), or provided by external sources (O) "

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Clause	Problem	Comments	Final decision
4.1.2.17	Add requirement for RBC information.	Whether a phone number is used, an address or a name is perhaps an SRS level of detail. The functional requirement is "If the onboard fails to contact the RBC when awakening the driver shall be asked to enter the RBC contact details (M)"	added: " If the onboard fails to contact the RBC when awakening the driver shall be asked to enter the RBC contact details (M)."
4.1.3.2 b and c	First sentence is a JRU issue Second sentence is a separate requirement	Unclear. If the area is also equipped with level 1 and the train is operating in level 1?	Move first sentence to 4.3.10 Delete 4.1.3.2 b and add second sentence as 4.1.3.2c, modified as "...if the train is operating under the control of a RBC"
4.1.3.2d	Add requirement for DMI: Permission received shall be indicated to the driver. (M)		add: "Permission received shall be indicated to the driver. (M) "
4.1.3.3	Editorial improvement.		It shall be possible to manually select Shunting
4.1.3.4 a	Editorial improvement		Editorial improvement
4.1.3.4 b	Editorial: Before automatic transition to Shunting, ETCS shall request confirmation from the driver. recoding topic to be moved		Modify: "Before automatic transition to Shunting, ETCS shall request confirmation from the driver." Second sentence moved to 4.3.10
4.1.3.5	Split in two requirements. Editorial ETCS shall supervise Shunting operation... Add requirement for display		Modify: 4.1.3.5 a: "ETCS shall supervise Shunting operation..." 4.1.3.5b: Add requirement for display
4.1.3.6	Wording	reword "It shall be possible to..."	reword "It shall be possible to..."
4.1.3.7	Not existing	Delete	delete
4.1.3.8b	Remove reference to data Entry		Modify: "when the driver selects exit from shunting"
4.1.4.2 a	not true for switching to SR.		Modify: "If ack is specified, the driver shall..."
4.1.4.2b	General JRU issue		Move to 4.3.10
4.1.4.3	Add requirement for DMI		Add requirement for DMI

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Clause	Problem	Comments	Final decision
4.1.4.4a	Distance is also supervised	Add distance	Add "distance"
4.1.4.4b	Second sentence is separate requirement	One line speed is not appropriate	Move second sentence to 4.1.4.4c and change to "...supervised to a ceiling speed..."
4.1.4.5	General statement		delete
4.1.4.7	Add requirement for stop signals		Add: "it shall be possible to order..."
4.1.5.1	Editorial improvement Add requirement for TAF		Improve text and rename 4.1.5.1 a Add requirements for TAF in 4.1.5.1 b
4.1.5.2	Not necessary		deleted
4.1.5.3	JRU mode recording should be general requirement		Move to 4.3.10
4.1.5.4	the list is not exhaustive; roll away protection and track conditions are missing. Also modify "line speed" to "ceiling speed".		Modify: "...shall provide supervision speed and distance"
4.1.5.6	Not existing		delete
4.1.6.1 b	Not a functional requirement.		Deleted.
4.1.6.2	Isolation equipment is not part of ETCS, so this requirement does not belong to this FRS		Sentence deleted; requirement for JR moved to 4.3.10.
4.1.6.3	Isolation equipment is not part of ETCS, so this requirement does not belong to this FRS:	it is not an ETCS function.	deleted
4.1.6.4	No subsystems defined		delete
4.1.6.5	The word "completely" is not appropriate		Delete the word "completely".
4.1.6.6	Clarification	delete "entire"	Delete "entire" Added "Isolation of ETCS trainborne..."
4.1.6.7	Not existing		delete
4.1.7.1	this seems a description of "E" STM.		Modify: "... from the national train control system by means of the STM (M)"
4.1.7.2	Editorial		Delete "exactly"

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Clause	Problem	Comments	Final decision
4.1.7.3	With national STMs, ETCS is not responsible of supervision. Moreover, this is a safety requirement, not functional		Delete
4.1.7.4	Not an ETCS functional requirement.		Delete
4.1.7.5	JR issue		Move to 4.3.10
4.1.7.6	Not ETCS requirement		Delete
4.1.8	Add requirements for operations in unfitted lines.		Add requirements for operations in unfitted lines: - level selection - supervision
4.2.1.1	Bad wording	"The ETCS onboard shall be capable of receiving track description from the trackside which is relevant for the supervision of the train".	Modified as following: "The ETCS onboard shall be capable of receiving track description from the trackside".
4.2.1.2	Not a proper requirement		deleted
4.2.1.3	Description of the adhesion function not complete	it is not "data". In 230 is only "slippery" or "not slippery".	Modified as following: "4.2.1.3 a: It shall be possible to send information on adhesion conditions from trackside; 4.1.2.3 b: It shall also be possible to allow the driver to change the adhesion conditions; in this case information from trackside has priority".
4.2.1.4	Bad wording	Make requirement for onboard	Changed: "4.2.1.4a The trackside shall be able to send information for the calculation of speed profiles. (M)" "4.1.2.4b If track data at least to the location where the movement authority ends are not available onboard the movement authority shall be rejected. (M)"
4.2.1.5	Bad wording	"Track to train transmission shall provide the capability to send different speed limits for specific train categories". speed profiles" is better than "speed limits"	"Track to train transmission shall provide the capability to send different speed profiles for specific train categories".

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Clause	Problem	Comments	Final decision
4.2.2.1	Bad wording		Modified: "...shall supervise the EoA, if this information is available on-board".
4.2.2.2	Bad wording. It is the most restrictive braking curve that determines the target which is visible to the driver.	This is not EoA supervision, but MRSP supervision.	Modified: "The target distance to be displayed on the DMI shall be based on the most restrictive braking curve."
4.2.2.3	Bad wording. Explain the action on time-out.		Modified: "Together with the movement authority, the on board shall be able to receive one or more time-out(s) for certain sections of the movement authority, and shorten the movement authority accordingly when a time out expires. (M) "
4.2.2.4 a and b	Technical solutions, not requirements		deleted
4.2.2.4c	Delete because is connected to 4.2.2.4a/b. To be covered by explanation 4.2.2.3.		deleted
4.2.2.5 a	Statement is correct but same as 4.2.2.3. Delete because to be covered by 4.2.2.3.		deleted
4.2.2.5 b	Technical solutions, not requirements		deleted
4.2.3.2	The speed level is a National Value		Modified: "The ceiling speed level for the movement authority shall be defined as a National Value. (M) "
4.2.3.3	Delete because covered in more detail by 4.2.3.6a/b		Deleted
4.2.3.4	Unclear	Modify: "...acknowledge that the driver is aware that the train is not..."	Modified: "Before entering an occupied track, a driver acknowledgment shall be requested..."
4.2.3.5	Unclear.	This is anyway a design issue for trackside (how and when send updated MA to a train in OS)	Deleted because it is a trackside requirement.
4.2.3.6b	What is a line speed? It is not in the glossary.	Change to "ceiling"	Delete "continually" and "momentarily" Modify: "...unless selected..." Changed "line speed" to "ceiling speed".

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Clause	Problem	Comments	Final decision
4.2.3.6c	It is not possible to know the location of the vehicles.		Modify: "The target distance shall not be shown on the DMI but may be shown unless selected by the driver"
4.2.3.6 d	Add requirements for TAF.		Add requirements for TAF
4.2.4	Delete function		Deleted
4.2.5	The whole function should be for future use	The function is recently executed by a level change to UN. For future use, I doubt if the requirements are acceptable as they are here.	Delete
4.3.1.2a	Clarification		Change "on the line" to "of the authorised movement"
4.3.1.2b	Clarification	What is track speed (not in the glossary)? Is permanent or temporary speed reductions?	No change Clarification for 3.0.0: What is track speed (not in the glossary)? Is permanent or temporary speed reductions?
4.3.1.3	Covered already by 4.3.2.2		deleted
4.3.1.4b	Delete because already covered in previous clauses		deleted
4.3.1.5	Not a requirement		deleted
4.3.2.1	Add requirement on inhibition of service brake		Rename 4.3.2.1 a Add requirement on inhibition of service brake in 4.3.2.1 b
4.3.2.2a	Editorial: When changing to		Changed as "When changing to..."
4.3.2.5	The first sentence is a safety requirement, not a functional requirement	Delete first sentence The second sentence should be reworded as a requirement (now it seems information). For example: "Braking curves shall be calculated in such a way that the train is able to respect the speed limitations in all locations"	First sentence: deleted. Second sentence: to be rewritten as a requirement.
4.3.2.6	Not a requirement		delete
4.3.2.7	Add requirement in case of service brake failure.	Must is not appropriate Is "danger point" in the glossary?	Must > shall Definition of "danger point" to be considered in 3.0.0.
4.3.3.2a	Already covered by 4.3.3.1		deleted
4.3.3.2 b	Explanation		Delete
4.3.3.2 c	Delete first sentence (general requirement)		Delete first sentence

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Clause	Problem	Comments	Final decision
4.3.3.2 d	Add requirement for release speed calculation		Add requirement for release speed calculation
4.3.3.5	Explanation		delete
4.3.4.4	This is a performance requirement		Delete
4.3.4.5 a to d	Not a requirement		delete
4.3.5.1b	This is not a requirement for ETCS		deleted
4.3.5.3	This is a performance requirement		delete
4.3.5.5	JRU issue		Transferred to 4.3.10
4.3.6	Title is not appropriate		Reworded as" indication displayed on the DMI."
4.3.6.1 and 4.3.6.2	DMI requirement not in SRS. This "material" requirement shall be deleted I think, these are also operational requirements. They are not necessarily reflected in the SRS, but should be in the DMI specification.		4.3.6.1 and 4.3.6.2 deleted (DMI requirements)
4.3.6.6.	Translation of fixed text messages is not available	Proposal: The driver shall have the possibility to choose the language, this does not concern non pre-defined texts sent from the trackside	Delete "Even if... shall be considered" First sentence reworded as following: "The driver shall have the possibility to select the language, this does not concern non pre-defined texts sent from the trackside".
4.3.6.7	Not 2.3.0		Delete
4.3.6.8	Repetition of 4.3.6.4, delete		deleted
4.3.6.9	Delete, outside ETCS.		deleted
4.3.6.10	Not a requirement on the DMI. The fail safe reaction of the trainborne equipment is covered by other safety requirements		deleted
4.3.7.2	Technical details	This seems a repetition of requirements in 4.3.6	Delete technical details. Consider merging with 4.3.6.5 for 3.0.0

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Clause	Problem	Comments	Final decision
4.3.7.3	Eliminate technical details. Last sentence is JRU issue	Move last sentence to 4.3.10 This is the requirement that the train, even when the emergency brake is used, shall not be braked to standstill. Editorial: the driver shall be able to release the brake (M).	Last sentence transferred to 4.3.10 Reworded: "driver shall be able to release the brake (M)."
4.3.7.4 a	General requirement		deleted
4.3.7.4b	The driver shall be able to release an ETCS emergency brake application when stationary. (M)		Reworded: ""The driver shall be able to release an ETCS emergency brake application when stationary. (M)"
4.3.7.4c	the driver may release the ETCS emergency		Reworded: "the driver may release the ETCS emergency"
4.3.4.7a	Repetition		Delete
4.3.7.4d	JRU issue		Transferred to 4.3.10
4.3.7.5	This is not a requirement for ETCS		Deleted
4.3.7.6	Not a requirement		delete
4.3.8	This is not a requirement for ETCS		Deleted
4.3.9.1a	Editorial		Change "required" to "permitted"
4.3.9.1b	Editorial		Change "measuring vehicle" to "train"
4.3.9.1c	Just indication on DMI is sufficient	Delete "visually and acoustically"	Delete "visually and acoustically" Reworded: "The roll away/reverse movement intervention shall..."
4.3.10	This section should list all ETCS items to be recorded.	Complete the list of items to be recorded	Collect all JR items
4.3.10.1	This is considered for the future		deleted
4.3.10.2	"...trainborne data recorder all data..." otherwise it may be understood that the ETCS trainborne data to be recorded are transmitted to the trackside for recording, which is not the case.		Reworded "All data entered, received or indicated to the driver shall be recorded onboard. All data shall be related to UTC (Universal Time Corrected) and a reference point. (M)"
4.3.10.3	Editorial: which enables a clear view of the functioning of ETCS and way the traction unit has been driven.		Reworded "which enables a clear view of the functioning of ETCS and way the traction unit has been driven."
4.3.10.4b	Already covered by 4.3.10.4a		deleted

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Clause	Problem	Comments	Final decision
4.3.10.5	"three" is not correct	three > two	three > two
4.3.10.6	Not an ETCS requirement		deleted
4.3.10.7	Add list of information to record		Add list of information to record
4.4.1.2 and 4.4.1.3	Editorial: ...cabs		Reworded: "...cabs"
4.4.1.4	Not existing		deleted
4.4.2.3	Not an ETCS requirement		deleted
4.4.2.4	Recording	Move to 4.3.10	Transferred to 4.3.10
4.4.2.5	Add requirement for data entry		Add requirement for data entry Further specification of functionality in tandem for 3.0.0
4.4.3	Not an ETCS requirement	Delete ok, banking movements have to be done by written orders outside ETCS.	Deleted
4.4.4	Not an ETCS requirement	Delete It is a requirement which could be executed in ETCS Level 2. Also this operation has to be done by written orders outside ETCS	deleted
4.4.5	Delete function		deleted
4.4.7	Add requirements for reversing		Requirements for reversing added in 4.4.7.1
4.5.1	editorial		Change to "intentionally deleted"
4.5.2.3	How long? How many signals?		How long? How many signals? For 3.0.0
4.5.2.6	Delete function		deleted
4.5.3	Delete function		deleted
4.5.4	This is a pure trackside function.		Deleted
4.5.5	Not an ETCS requirement		deleted
4.5.6	Not an ETCS requirement		deleted
4.6.1	Not an ETCS requirement		Deleted
4.6.2	Not an ETCS requirement		Deleted
4.6.3	Not an ETCS requirement		deleted

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Clause	Problem	Comments	Final decision
4.6.4.1	Only if supervised by the RBC Add requirements for unconditional and conditional stops		Modify: "4.6.4.1 a If supervised by a RBC it shall be possible..." Add two requirements for unconditional and conditional stops Include conditional emergency in the glossary (for 3.0.0)
4.6.4.2	Not an ETCS requirement		deleted
4.6.4.3 to 4.6.4.6	Not an ETCS requirement		deleted
4.6.4.7	The 0.5s is not a functional requirement	Delete "in less than 0.5s"	Delete "in less than 0.5s"
4.6.4.8	Just indication on DMI is sufficient	Delete "visually and acoustically"	Delete "visually and acoustically"
4.6.4.9	Not an ETCS requirement		deleted
4.6.4.10	Not in all cases correct. Anyway not relevant in the context of this function.		deleted
4.6.5	Not an ETCS requirement	Delete	To be considered in the future.
4.6.6.	Not an ETCS requirement	Delete Ok, this will also require the rules writing group to issue the relevant rules. Meanwhile the operation on level crossings will be provided with written orders.	deleted
4.6.7	Not an ETCS requirement	Delete Ok, this will also require the rules writing group to issue the relevant rules. Meanwhile the operation on level crossings will be provided with written orders.	deleted
4.6.8	Not an ETCS requirement	Delete OK, this means that the level crossing activation and de-activation is always outside ETCS.	deleted
4.6.9	Not an ETCS requirement	Delete OK, it will be done with written orders.	deleted
4.6.10	Not an ETCS requirement	Delete OK it will be done with other means. If the ETCS train is concerned, written orders will be issued.	deleted

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Clause	Problem	Comments	Final decision
4.6.11.1 a and b	The wording of this sentence implies that it is mandatory to use ETCS to implement this protection. To be in line with the normal approach in the FRS, we should say that "it shall be possible to inform a train..."	To be rewritten: - it is not mandatory to implement the function trackside; - there is no "intervention"	Reword 4.6.11.1 a: "It shall be possible..." Delete 4.6.11.1 b
4.6.11.1 d	Not 2.3.0		delete
4.6.11.2	Last sentence: Recording	Move last sentence to 4.3.10	Last sentence transferred to 4.3.10
4.6.11.3	Editorial the movement authority shall be re-established		Reworded: "the movement authority shall be re-established"
4.6.12.1	The 0.5s is not a functional requirement	Delete "in less than 0.5s after passing the information point" The description is not accurate. Substitute "stop signal with transmission capability" with "the distance limits communicated by trackside".	Deleted "in less than 0.5s" Modify: "When a traction unit passes a stop signal, the emergency brake shall be triggered"
4.6.12.2	Just indication on DMI is sufficient	Delete "visually and acoustically"	Delete "visually and acoustically"
4.6.12.4	Editorial the driver shall be required		Reworded: "the driver shall be required"
4.6.12.5	Split in two requirements: continue the movement and possibility of backward movement	After trip there is no more MA	Split in two requirements: continue the movement and possibility of backward movement To be considered for 3.0.0.
4.6.12.6	Not a requirement.		Deleted
4.6.12.7	Too general. Specified already with the relevant functions		deleted
4.6.12.8	Not an ETCS requirement		deleted
4.6.12.9	Recording	Move to 4.3.10	Transferred to 4.3.10
4.7.1.1	Bad wording		Delete "part of which has been entered as train data" Reworded: The ETCS trainborne equipment shall transmit its own train identification to the RBC
4.7.1.2 and 3	Not an ETCS requirement		Deleted
4.7.1.4	First sentence is not clear		Delete first sentence

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Clause	Problem	Comments	Final decision
4.7.1.5 and 6	Not an ETCS requirement		deleted
4.7.2	Not an ETCS requirement		deleted
4.7.3.1	Not an ETCS requirement		deleted
4.8.1.1	Bad wording		To be rewritten as: "The ETCS onboard shall be capable of receiving information regarding pantograph and power supply from the trackside"
4.8.1.2	Not an ETCS requirement		deleted
4.8.1.3	Not an ETCS requirement		deleted
4.8.1.4a and b	Not an ETCS requirement		deleted
4.8.1.5a	Bad wording	"The ETCS trainborne equipment shall indicate the information regarding pantograph and power supply on the DMI".	Rewritten as: "The ETCS trainborne equipment shall indicate the information regarding pantograph and power supply on the DMI".
4.8.1.5b	Delete function		Delete
4.8.1.6	Bad wording	Add: "The information regarding lowering and "..."	Add: "The information regarding lowering and ".."
4.8.1.7	Not a requirement		delete
4.8.2	"conditioning" is not the right term It would better to use the term "air tightness" as air conditioning may be understood temperature control.		Change "conditioning" to "tightness"
4.8.2.1	Bad wording	"The ETCS onboard shall be capable of receiving information regarding air tightness from the tracks"	Reword as: "The ETCS onboard shall be capable of receiving information regarding air tightness from the tracks"
4.8.2.2 and 3	Not an ETCS requirement		deleted
4.8.3	Not an ETCS requirement		deleted
4.8.4	Possible future function		delete
4.8.5	Not an ETCS requirement		deleted
4.8.6	Not an ETCS requirement		deleted
4.8.7	Not an ETCS requirement		deleted
4.8.8.2	Fixed messages not defined in 2.3.0		deleted
4.8.8.3	Editorial improvement		Modify: "... on the DMI, the driver shall be alerted"
4.8.8.4	Fixed messages considered separately in 4.8.9		Deleted and moved to 4.8.9

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Clause	Problem	Comments	Final decision
4.8.8.5 and 4.8.8.6	Add requirements for display		Add requirements for display
4.8.9	Add requirements for fixed messages		Add requirements for fixed messages
4.8.9.2	Editorial improvement		Modify the old 4.8.8.4: "... in the language selected by the driver"
4.8.10	Add requirements for special brakes		Add requirements for special brakes
4.9.1	Not an ETCS requirement		deleted
4.9.2	Not an ETCS requirement		deleted
4.9.3	Not an ETCS requirement		deleted
4.9.4	Not an ETCS requirement		deleted
4.9.5.1	Should only be a requirement on ETCS, not on an external system	Reword to make it an ETCS requirement to transmit train integrity from train to track.	To be rewritten.
4.9.5.2	Not 2.30		deleted
4.9.5.3	Already covered by 4.9.5.1		deleted
4.9.5.4	Ambiguous requirement. What is the limitation of the driver confirmation? Where will it end?	To be clarified.	Delete "... if there is a failure of normal train integrity system."
4.9.5.6	Not an ETCS requirement		deleted
4.9.6	Not an ETCS requirement		deleted
4.9.7.1	Already covered by 4.1.3.2c		deleted
4.9.7.2	Should be kept together with 4.9.7.1	Move to 4.1.3.2d	Move to 4.1.3.2d
4.9.7.3	Not an ETCS requirement	Delete This is a trackside function	deleted
4.9.8	Duplication of existing requirements		deleted
4.9.9	Add requirements on train data to be sent to trackside	Add all relevant data.	Add requirements on train data to be sent to trackside "4.9.9.1 The on board shall be capable of sending train data to the trackside after confirmation by the driver, or when entering the RBC area" 4.9.9.2 The following train data shall be sent..."
4.9.10	Add requirements on revocation of a MA	Taken from old 11.7.1 Rules for route release is not ETCS	Add requirements on revocation of a MA Editorial improvement Delete requirement on route release

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Clause	Problem	Comments	Final decision
4.9.11	Add requirements for reversing	Taken from old 11.3.2 Reversing is not limited to RBC areas	Add requirements for reversing, deleting "in an RBC area"
4.9.12	Add requirements for RBC handover	Taken from old 11.1.1 The requirement that transition shall be "invisible" to the driver is not correct.	Add requirements for RBC handover Editorial improvement Delete requirement on transition invisible
5.1	Format of the title		Format like other level 2 titles
5.1.1	Not a functional requirement		delete
5.1.2	Not a functional requirement.		deleted
5.1.3.1, 2, 3	Badly structured	Restructure as one numbered clause saying that onboard shall react according to 3 possible values of a National Value. Delete the word "option".	Change "options" in "reactions" Improve numbering of requirements.
5.1.3.4a to 5.1.3.6	Not ETCS requirements		delete
5.2.1.2a	No limitation to stationary. Only the fact that a failure has occurred is displayed, not the failure itself. This is a mandatory requirement.	Modify text accordingly. O > M	No limitation to stationary. Only the fact that a failure has occurred is displayed, not the failure itself. This is a mandatory requirement. O > M
5.2.1.2 b	Not ETCS requirement		delete
5.2.1.2c	Should be in the general function 4.9.9 as a mandatory mode change report.	O > M	O > M
5.3	These issues are not functional requirements. Main issue covered by 5.2.1.2a		deleted
6	Not functional requirements The relevant functional requirements regarding DMI will be part of the mandatory DMI specification.		deleted
10	Due to modification in the main part of the FRS the glossary might not be consistent anymore.	To be checked and updated	To be done in the future.

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Clause	Problem	Comments	Final decision
11	To be moved or not functional requirements	<p>Whatever is relevant in chapter 11 has been moved to the relevant functions in the other chapters.</p> <p>11.1.1 → 4.9.12 11.2.1 → 3.2; 4.3.10 11.3.1 → data entry in 4.1.2; other requirements deleted 11.3.2 → 4.9.11 11.4.1 → deleted 11.4.2 → deleted 11.5.1 → deleted 11.6.1 → deleted 11.7.1 → 4.9.10 11.9.1 → deleted 11.11.1 → deleted 11.12.1 → deleted 11.14.1 → 3.2.1.3b; other requirements deleted 11.15.1 → 4.8.8; 4.8.9</p>	deleted

4.2. The following table indicates how requirements in ERTMS/ETCS Functional Statements have been included in FRS version 5.0.

Clause	Problem	Comments	Final decision
2.1.1	To be covered by the mandatory DMI specification.	Delete	deleted
2.1.2	Covered by FRS 4.1.2.5	Delete	deleted
2.1.2.1	Not a functional requirement. (implementation)	Delete	deleted
2.1.3	Should be covered in a general requirement on level/STM selection by driver in FRS 3.2.	Reword and move to FRS 3.2.	To be rewritten and to move to FRS 3.2.
2.1.4	Covered by FRS 4.1.2.16	Delete	deleted
2.1.4.1	The possibility to do this should be covered by 4.1.2.13	Delete here and modify FRS 4.1.2.13 accordingly.	To be rewritten and to move to FRS 4.1.2.13.
2.1.4.2	Already covered by 2.1.4.1	Delete	deleted
2.1.4.3	Covered by 4.1.2.16	Delete	deleted
2.1.5	These requirements are already covered in the FRS, but the wording should be improved. (sometimes the positive requirements is missing or general requirements (driver ID) in specific sections.	Delete here and improve the wording in the FRS.	To be considered in FRS 4.1.2.
2.1.6	Covered by FRS 4.1.2.14a	Delete	deleted

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Clause	Problem	Comments	Final decision
2.1.7	Covered by FRS 4.1.2.16	Delete	deleted
2.1.8	NID_OPERATIONAL to L_TRAIN are covered by FRS 4.9.9.2 ETCS ID is included in SRS230. Brake data not in SRS230.	Delete the first 9. ETCS ID to be added to FRS 4.9.9. Brake Data to be discussed.	Delete the first 9. ETCS ID to be added to FRS 4.9.9. Brake Data to be discussed.
2.1.9	Not understandable	Delete	delete
2.1.10	Covered by 2.1.3	Delete	deleted
2.1.11	Covered by FRS 4.1.2.14b	Delete	delete
2.1.12	First 2 are covered by 2.1.11. The rest is covered by FRS 4.1.2.8a.	Delete	deleted
2.1.13	Not included in SRS230	Delete here and move to FRS 4.1.2 and classify as F (i.e., deleted in FRS 5.0).	To be transferred into FRS 4.1.2 as a F.
2.2.1	Covered by 2.3	Delete	deleted
2.2.1.1	JRU issue covered by FRS 4.3.10. Communication issue to be included in 4.4.1.2	Delete here and modify 4.4.1.2 accordingly.	Communication issue to be included in 4.4.1.2.
2.2.2	Not a functional requirement	Delete	deleted
2.2.2.1	Not a functional requirement	Delete	deleted
2.2.3	First sentence: BMM is technical Traction orders covered by FRS 4.8.1 Eddy current missing in FRS 4.8	Include special brakes in FRS 4.8, delete the rest.	Add chapter 4.8.10: "management of special brakes"
2.2.3	Second sentence: BMM is technical	Delete	deleted
2.2.3	Third sentence: Linking is technical	Delete	deleted
2.2.4	Automatic selection is the requirement	Delete	deleted
2.2.5	First part of sentence: Contact with RBC is in itself not a functional requirement.	Specify in more detail the relevant functional requirements in 4.4.1 (Sleeping) and 4.4.2 (Non Leading)	Deleted (such a requirement is not existing for the master traction units)
2.2.5	Second part of sentence: reporting of mode change in general not in FRS. Is it a functional requirement?	To be considered for the future.	To be considered in the future
2.2.6	Not an ETCS requirement	Delete	deleted
2.2.7	Not a functional requirement	Delete	deleted
2.3.1	Covered by FRS 4.1.5.1 and 4.1.2.15.	Delete	deleted

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Clause	Problem	Comments	Final decision
2.3.1.1	Not a functional requirement	Delete	deleted
2.3.2	Not a functional requirement	Delete	deleted
2.3.2.1	Not a requirement	Delete	deleted
2.3.2.2	Bad wording, unclear what the requirement is.	Delete	deleted
2.3.3	Not a functional requirement	Delete	deleted
2.3.4	First sentence: Not a functional requirement	Delete	deleted
2.3.4	Second sentence: Missing in the FRS	Add in 4.1.1.	Second sentence added in 4.1.2.17
2.3.5	Not a functional requirement	Delete	deleted
2.4.1	Implicitly covered by 4.1.3	Delete	deleted
2.4.2	Covered by 4.1.3	Delete	deleted
2.4.3.1/2	Covered by 4.1.3.6	Delete	deleted
2.4.4	Covered implicitly by 4.1.3	Delete	deleted
2.4.4.1 (written 2.4.2.1)	General requirement implicitly covered by FRS	Delete	deleted
2.4.5	Not a functional requirement	Delete	deleted
2.4.6	Covered by 4.1.3.4a	Delete	deleted
2.4.7	Covered by 4.1.3.5b	Delete	deleted
2.5.1	The driver does not request a transition to SR; in case of override it is not reasonable to ask a confirmation from the RBC.	Delete	Deleted
2.5.1.1	Covered by 4.5.2.2.1	Delete	deleted
2.5.2	Missing in FRS 4.5.2	Add statement in 4.5.2	Added in 4.1.5.1b
2.5.2.1	Not a functional requirement	Delete	deleted
2.5.2.2	Not a functional requirement	Delete	deleted
2.5.2.3	Not a functional requirement	Delete	deleted
2.5.2.4	Too detailed for FRS	Delete	deleted
2.5.3	Covered by 4.3.7	Delete	deleted
2.5.4	Covered by 4.5.2.7	Delete	deleted
2.5.5.1	Covered by 4.5.2.3	Delete	deleted
2.5.5.2	Implicitly covered by 4.1.4.4a	Delete	deleted
2.5.5.3	Implicitly covered by 4.1.4.4a	Delete	deleted
2.5.6.1	Supervision covered by 4.1.4.4a	Delete supervision. Modification by driver to be added in 4.5.2.	Deleted: this clarification belongs to the SRS.
2.5.6.2	Supervision covered by 4.1.4.4a	Delete supervision. Modification by driver to be added in 4.5.2.	Deleted: this clarification belongs to the SRS.
2.5.7	The driver does not select SR	Delete	deleted

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Clause	Problem	Comments	Final decision
2.5.7.1	Supervision covered by 4.1.4.4a	Delete supervision. Modification by driver to be added in 4.5.2.	Deleted: this clarification belongs to the SRS.
2.5.7.2	Supervision covered by 4.1.4.4a	Delete supervision. Modification by driver to be added in 4.5.2.	Deleted: this clarification belongs to the SRS.
2.5.7.3	Missing in FRS	Add statement in 4.6.12	Added in 4.6.12.5b
2.5.8.1	Supervision covered by 4.1.4.4a	Delete supervision.	Already done
2.5.8.2	Supervision covered by 4.1.4.4a	Delete supervision.	Already done
2.5.8.3	Not an ETCS function	Delete	deleted
2.5.8.4	Missing in FRS	Add to 4.1.4	Not added (too detailed).
2.5.9	Missing in FRS	Add to 4.1.4	Not added (too detailed)
2.5.10	Infill not described sufficiently in FRS	Add description of infill	To be considered in the future
2.5.11	Not a functional requirement	Delete	deleted
2.5.12	Covered by 4.1.4.4b	Delete	deleted
2.5.13	Covered by 4.1.4.7	Delete	deleted
2.6.1	Covered by 4.1.4.4b	Delete	deleted
2.6.2	Covered by 4.3.7	Delete	deleted
2.6.3	Covered by 4.2.3.1	Delete	deleted
2.6.4	Covered by 4.3.3.2a	Delete	deleted
2.6.5	Covered by 4.2.3.6d	Delete	deleted
2.6.5.1	Not a functional requirement	Delete	deleted
2.6.5.2	Not a functional requirement	Delete	deleted
2.6.5.3	Not a functional requirement	Delete	deleted
2.6.5.4	Too detailed for FRS	Delete	deleted
2.6.6	Infill not described sufficiently in FRS	Add description of infill	To be considered in the future
2.6.7	Covered by 4.1.4.4b	Delete	deleted
2.7/8/9	Not a functional requirement	Delete	deleted
2.10.1	Covered by 3.9.1.2c	Delete	deleted
2.11.1	Missing in FRS 3.2	Add to FRS 3.2	Added in 3.2.1.5
2.11.1.1	Missing in FRS 3.2	Add to FRS 3.2	Added in 3.2.1.5
2.11.1.1.1	Not a functional requirement	Delete	deleted
2.11.1.2	Missing in FRS 3.2	Add to FRS 3.2	Added in 3.2.1.5
2.11.2	Not a functional requirement	Delete	deleted
2.11.3.1	Not a functional requirement	Delete	deleted
2.11.3.2	Not a functional requirement	Delete	deleted
2.11.4	Missing in FRS 3.2	Add to FRS 3.2	Not added (too detailed)
2.11.5	Covered by 3.2.1.3d	Delete	deleted
2.11.6	Not a functional requirement	Delete	deleted
2.11.7	Not a functional requirement	Delete	deleted
2.11.8	Not a functional requirement	Delete	deleted
2.12.1.1	Not a functional requirement	Delete	deleted

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Clause	Problem	Comments	Final decision
2.12.1.2	Functions not linked to levels in the FRS	To be discussed	To be considered in the future
2.12.2	Covered by 3.2.1.3b	Delete	deleted
2.12.3	Covered by 3.2.1.3c	Delete	deleted
2.12.4	Covered by 3.9.1.4	Delete	deleted
2.12.5	Covered by 3.9.1.4	Delete	deleted
2.13.1	not a functional requirement		Deleted
2.13.2	not a functional requirement		Deleted
2.13.2.1	not a functional requirement		Deleted
2.13.2.2	not a functional requirement		Deleted
2.13.2.3	not a functional requirement		Deleted
2.13.3	not a functional requirement		Deleted
2.14.1			To be considered in the future
2.14.2	not a functional requirement		Deleted
2.14.3			To be considered in the future
2.14.4	not a functional requirement		Deleted
2.14.5	not a functional requirement		Deleted
2.15.1	not a functional requirement		Deleted
2.16.1	covered by 4.6.4.1		Deleted
2.16.2			Added in 4.6.4.1a
2.16.2.1			Added in 4.6.4.1a
2.16.2.2			Added in 4.6.4.1b
2.16.2.3			Added in 4.6.4.1c
2.17.1			Added in 4.4.7.1
2.17.1.1			Added in 4.4.7.1
2.18.1	Already contained in 3.10.1.1		deleted
2.18.2	See FRS 3.10.1.3		deleted
2.18.3			Added in 3.10.1.6
2.18.4	Contradictory with 2.18.3; see FRS 3.11		deleted
2.18.5	technical		deleted
2.18.6	Not functional requirement		deleted
2.19.1	Not functional requirement		deleted
2.19.2	Not functional requirement		deleted
2.19.3	See FRS 4.2.1.3a and 4.2.1.3b		deleted
2.19.3.1	Not a functional requirement		deleted
2.20.1	technical		deleted
2.20.2	technical		deleted
2.20.2.1	technical		deleted
2.21.1	JRU		Add in JRU section of the FRS

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Clause	Problem	Comments	Final decision
Annex A Function 1 1st bullet point	technical		deleted
Annex A Function 1 2nd bullet point	technical		deleted
Annex A Function 1 3rd bullet point	technical		deleted
Annex A Function 1 4th bullet point	technical		deleted
Annex A Function 1 5th bullet point	technical		deleted
Annex A Function 1 6th bullet point	technical		deleted
Annex A Function2 1st bullet point	technical		deleted
Annex A Function2 2nd bullet point	technical		deleted
Annex A Function2 3rd bullet point	technical		deleted
Annex A Function 3 1st bullet point	Not a functional requirement		deleted
Annex A Function 3 2nd bullet point	Not a functional requirement		deleted
Annex A Function 3 3rd bullet point	technical		deleted
Annex A Function 3 4th bullet point	technical		deleted
Annex A Function 3 5th bullet point	technical		deleted