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RECOMMENDATION FOR USE

NB-RAIL COORDINATION GROUP

Administrative Decision according to Interoperability Directive
(EU) 2016/797 art. 30.6



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RFU-CCS-077

Issue 04

Date 18/11/2021

TITLE	
MANAGEMENT OF 'CONDITIONS AND LIMITS OF USE OF INTEROPERABILITY CONSTITUENTS AND SUBSYSTEMS'	
ORIGINATOR	SUBJECT RELATED TO
CERTIFER, SINTEF, VUŽ	CCS TSI (EU) 2016/919 amended by Reg. (EU) 2019/776
<p>AMENDMENT RECORD:</p> <p>Issue 03: aligned with CCS TSI 2016 & Reg. (EU) 2019/776 and integrating comments from the CCS SG</p> <p>Issue 04: ERA disclaimer added at the end</p>	
DESCRIPTION AND BACKGROUND EXPLANATION	
<p>Introduction</p> <p>Manufacturers of ERTMS equipment sometimes want to place products on the market and Infrastructure Managers and Railway Undertakings (or their subcontractors) accept to place Control-Command and Signalling Trackside or On-board Subsystems in service that do not offer the full ERTMS functionality, but that nevertheless are safe, reliable and available, healthy, environmental protective and technically compatible. In certain cases and under the conditions, specified in the applicable legislation (see the IOD and section 6.4.3 of the TSI CCS), partial fulfilment of the requirements is legally allowed.</p> <p>Not offering the full functionality usually means that some requirements for functions, levels, modes, performance or interfaces are not respected, which are not necessary from the functional perspective and the limited scope of a project or contract. The Essential Requirements are respected, but obviously, there are limitations on technical compatibility.</p> <p>Examples are not implementing functionality on-board, when the area of use does not require that function, or not implementing interfaces when equipment, e.g. a Radio Block Centre, is used stand-alone. A train equipped with partial functionality may not be able to run on all lines/networks in Europe. As long as it is technically compatible with the lines on which the Railway Undertaking wants to operate, this can be acceptable from a technical point of view. Even if a stand-alone RBC would be equipped with it, the RBC-RBC interface cannot be validated, because the interface cannot be tested. Full compliance with the requirements cannot be proven, so a 'full' assessment will be impossible. Nevertheless, it can be fully justified to place such a Subsystem into service.</p> <p>Partial fulfilment of the requirements will result in conditions and restrictions on the use of the Interoperability Constituents or Subsystems. The TSI CCS requires in that case</p>	

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that the 'EC' certificates and NoBo files provide all related information. These should therefore be presented as 'Conditions and Limits of Use' (see RFU-STR-001 and RFU-STR-011).

This RFU gives guidance on the certification of CCS Interoperability Constituents and Subsystems by Notified Bodies, in case of partial fulfilment of the requirements from the TSI CCS.

Partial fulfilment of the requirements due to limited application of the TSI is allowed in case the criteria from both the IOD and TSI CCS are met (see the next section). However, it should be noted that today, ERTMS is a mature and stable system. There is a strong political interest to implement the full functionality in every ETCS on-board system. Considering also the costs for maintaining different product configurations and other complications, e.g. in case of route changes or changes to the infrastructure, it is not recommended to supply ETCS on-board equipment that does not offer the full functionality.

Legal basis

The Railway Interoperability Directive (EU) 2016/797 gives 5 cases in which partial compliance with the requirements from a TSI is allowed for Subsystems:

1. if the TSI itself allows certificates for parts of a Subsystem (art. 15 – clause 7),
2. in case of a derogation has been granted,
3. in case of partial application of TSIs for upgrade or renewal,
4. if allowed in a transitional period specified in the TSI (this case is not applicable for the TSI CCS),
5. or in specific cases (see Annex IV, clause 2.3.1 for items 2 - 5)

Note that previous Railway Interoperability Directive 2008/57/EC gave similar criteria.

In the first case, the TSI CCS specifies the scope and parameters (and therefore the scope of verifications) for the defined parts. For instance, integrating just the voice radio part into the CCT subsystem of a railway line or just an ETCS level 1 system (the train protection part) into the CCO subsystem of a vehicle is always possible. No decision of a Member State, the Commission and/or the Agency is required here. In the next 2 cases, such a decision is necessary. The scope of verifications and the parameters that need to be checked by the NoBo depend on this decision.

The Directive foresees (in section 2.3.1 of its Annex IV) that in the cases 2 - 5, *the certificate of verification shall give the precise reference to the TSI(s) or their parts whose conformity has not been examined by the notified body during the verification*

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procedure. In case 1, the certificate shall simply be provided for the part that is assessed.

Partial compliance with the requirements is further clarified in the TSI CCS. This TSI states in article 6.4.3:

A certificate of conformity for an interoperability constituent can be issued even if some function, interface or performance has not been implemented.

“If a Control-Command and Signalling Subsystem does not implement all functions, performance and interfaces... the certificate of verification shall indicate which requirements have been assessed and the corresponding conditions and restrictions on the use of the subsystem and its compatibility with other subsystems.” This clause is also applicable in case the CCO subsystem of a vehicle consists only of the train protection, voice radio or data radio part.

Additionally, CCS TSI clause 4.2.1 clarifies that:

“(1) The design, implementation and use of a Control-Command and Signalling On-board or Trackside subsystem shall not export any requirements:

- (a) across the interface between Control-Command and Signalling On-board and Trackside subsystems in addition to the requirements specified in this TSI;*
- (b) to any other subsystem in addition to the requirements specified in the corresponding TSIs.”*

Unacceptable technical solutions

The demand of projects is not always justifiable. For example, some technical solutions do not meet the Essential Requirements for safety, reliability and availability, health, environmental protection, or technical compatibility (see Annex III to the IOD) and some of them prevent full TSI compliant on-board equipment from normal (interoperable) operation or from being compatible with the trackside. In these cases, the Notified Body shall refuse to issue a certificate.

Alignment of approaches

In order to align their approaches, the Notified Bodies for the Control-Command and Signalling subsystems of the rail system in the European Union have defined technical acceptance criteria in this Recommendation for Use, in coordination with the European Railway Agency's ERTMS unit (as required by art. 6.4.3.3 of the TSI CCS).

The technical acceptance criteria are given below on a higher and on a lower level: on the level of Essential Requirements and on the level of specific limitations. The higher-level acceptance criterion shall always be met. The list of specific limitations is comprehensive but not exhaustive. Limitations that are not listed may be acceptable if the higher-level criterion is met.



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The list will be reviewed and updated by the NB Rail subgroup CCS on a regular basis.

Safety aspect

It has to be stressed that in any case, the safety requirements have to be fulfilled. That means that the Interoperability Constituent or Subsystem shall react safely to all inputs/commands and all operational conditions allowed by the TSI CCS, especially to all events belonging to the not implemented functionality. For instance, when an *ETCS on-board* has not implemented the radio infill function, it needs to be demonstrated that it responds in a safe way to a command to establish a session with a trackside Radio Infill Unit.

Additional notes

This RFU is based on TSI Control-Command and Signalling (EU) 2016/919, as amended by Regulation (EU) 2019/776. There is no reason why it cannot be applied in case the original (EU) 2016/919 version of the TSI CCS are still applied by the Applicant, but in that case, some wording or paragraph numbers in the TSI could be slightly different.

This RFU applies to all Certificates Types, which are listed in RFU-STR-001, so also to ISVs.

Conditions and Limits of Use shall be formulated in technical terms: e.g. in terms of functions, levels, modes, performance or interfaces. Geographical terms are not acceptable.

The Applicant shall mention the Conditions and Limits of Use in its 'EC' Declaration of Conformity (for Interoperability Constituents; see article 10 of Directive (EU) 2016/797) or in its 'EC' Declaration of Verification (for Subsystems; see article 15 of Directive (EU) 2016/797).

The originators of this RFU analysed possible limited applications of the requirements from the TSI CCS in a systematic way. Some limitations listed below may be rather theoretical, but they were added for completeness.

In the tables below, a rationale is given for the 'agreement'. This is a justification why, in general, a certificate with Conditions and Limits of Use can be issued or should be refused.

Note finally that the assessment of the actual compatibility between trackside and on-board Subsystems is not in the scope of the 'EC' Verification done by the NoBo but is in the scope of the Railway Undertaking's route compatibility check, which should be covered by its Safety Management System (see the TSI OPE). However, it should also

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be noted that limitations might affect the outcome of ESC or RSC tests, on which a NoBo has to report.

RFU PROPOSAL

Essential Requirements

The general acceptance criterion for Control-Command and Signalling Interoperability Constituents and Subsystems, which do not offer the full ERTMS functionality, is compliance with Essential Requirements, without conflicting, violation or contradictions. When the Essential Requirements for safety, reliability and availability, health and environmental protection are fully met, and the Essential Requirements for technical compatibility are met for only those parts that apply to the restricted situation, a certificate with Conditions and Limits of Use may be issued.

Meeting the Essential Requirements for safety implies that the Interoperability Constituent or Subsystem shall react safely to all inputs/commands and all operational conditions allowed by the TSI CCS, especially to all events belonging to the not implemented functionality. The Applicant shall demonstrate this by validation (analysis and test) and the safety performance needs to be confirmed by the AsBo in charge of the independent safety assessment.

Specific functions, performance and interfaces

Above acceptance criterion is detailed further for currently recognised limited functionality. The tables give general guidance that can be followed in most situations. However, in specific situations (projects) there may be arguments for other decisions than the ones generally agreed, especially when there is a combination of limitations. Note that this listing is not exhaustive and may be updated with experience from practice.

The list applies to both Interoperability Constituents and Subsystems like above general acceptance criterion. It distinguishes in on-board and trackside, and further in ETCS levels, ETCS modes, internal and external interfaces and Change Requests. For the train detection parts of ERTMS, currently no limitations have been identified.

1. ETCS on-board levels

The table below describes the acceptability of levels not being implemented.



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Level not implemented	Agreement	Rationale
Level STM (baseline 2) / NTC (baseline 3)	'EC' certificate with Conditions and Limits of Use	Can safely be operated on Class A lines
Level 0	'EC' certificate with Conditions and Limits of Use	Can safely be operated on Class A lines and on Class B lines when equipped with the appropriate STM or class B on-board system
Level 1 (and higher levels)	Refuse to issue an 'EC' certificate	This is not an ETCS system
Level 1, while level 2 is implemented	'EC' certificate with Conditions and Limits of Use	Can safely be operated on level 2 infrastructure
Level 1, while level 3 is implemented	'EC' certificate with Conditions and Limits of Use	Can safely be operated on level 3 infrastructure
Level 2 (and 3)	'EC' certificate with Conditions and Limits of Use	Can safely be operated on level 1 infrastructure.
Level 2, while level 3 is implemented	'EC' certificate with Conditions and Limits of Use	Can safely be operated on level 1 and level 3 infrastructure
Level 3	'EC' certificate with Conditions and Limits of Use	Can safely be operated on level 1 and level 2 infrastructure

2. ETCS on-board modes

The table below describes the acceptability of modes not being implemented.

Mode not implemented	Agreement	Rationale
ISOLATION	'EC' certificate [with Conditions and Limits of Use]	This functionality may be realised outside the EVC

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NO POWER	Refuse to issue an 'EC' certificate	Essential for functioning
SYSTEM FAILURE	Refuse to issue an 'EC' certificate	Essential for functioning
SLEEPING	'EC' certificate with Conditions and Limits of Use	Acceptable for single engines
STAND BY	Refuse to issue an 'EC' certificate	Essential for functioning
SHUNTING	'EC' certificate with Conditions and Limits of Use	Can safely be operated on Class A infrastructure where Shunting mode is not implemented Not essential when not used by the Railway Undertaking
FULL SUPERVISION	'EC' certificate with Conditions and Limits of Use	In case mode 'Limited Supervision' is implemented on-board and the vehicle is intended for running on LS lines only
	Refuse to issue an 'EC' certificate	In other cases: safety critical in level 1, 2 or 3
UNFITTED	'EC' certificate with Conditions and Limits of Use	Acceptable when level 0 is not implemented; can safely be operated on Class A or Class B infrastructure
STAFF RESPONSIBLE	Refuse to issue an 'EC' certificate	Essential mode for level 1, 2 or 3 operation
ON SIGHT	'EC' certificate with Conditions and Limits of Use	Can safely be operated on Class A infrastructure where On Sight mode is not implemented (however this is unlikely)
TRIP	Refuse to issue an 'EC' certificate	Safety critical mode
POST TRIP	Refuse to issue an 'EC' certificate	Essential for operation
NON LEADING	'EC' certificate with Conditions and Limits of Use	Acceptable when tandem operation is not desired by the Applicant

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NATIONAL SYSTEM	'EC' certificate with Conditions and Limits of Use	Acceptable when level STM is not implemented and/or when no STM will be attached
REVERSING	'EC' certificate with Conditions and Limits of Use	Can safely be operated on Class A infrastructure where Reversing mode is not implemented
LIMITED SUPERVISION	'EC' certificate with Conditions and Limits of Use	Can safely be operated on Class A infrastructure where Limited Supervision mode is not implemented.
PASSIVE SHUNTING	'EC' certificate with Conditions and Limits of Use	Acceptable when not desired by the Applicant

3. ETCS on-board interfaces

The acceptability of interfaces not being implemented is given in the table below.

Interface not implemented	Agreement	Rationale
Interface to STM (§ 4.2.6.1)	'EC' certificate with Conditions and Limits of Use	Acceptable when level STM is not implemented or when no STM will be attached
Interface to GSM-R Radio Data Communication (§ 4.2.6.2)	'EC' certificate with Conditions and Limits of Use	Acceptable when level 1 with radio infill and level 2 are not implemented
Interface to Odometry (§ 4.2.6.3)	'EC' certificate	This interface is only required when odometry equipment is supplied as a separate interoperability constituent
	Refuse to issue an 'EC' certificate	When odometry is supplied as a separate interoperability constituent and the interface is not implemented, a certificate shall be refused, since the on-board will not function
Interface to ETCS DMI (§ 4.2.12)	Refuse to issue an 'EC' certificate	Essential interface

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Interface to data recording (§ 4.2.14)	Refuse to issue an 'EC' certificate	Essential interface
Interfaces to other subsystems (§ 4.3)	<No recommendation>	

4. Change requests

The IC or Subsystem (or its train protection, voice radio, data radio or train detection part) will be designed according to a release of the TSI Annex A. However, often Change Requests (CRs) are implemented which are formalised in a later release of the TSI Annex A (possibly in a new baseline). A list of acceptable CRs, which could be implemented without jeopardizing interoperability, is not available for each baseline. It is likely that CRs give additional functionality or correct errors; it is unlikely that functionality is not implemented. Acceptability is basically possible, but it has to be demonstrated by the Applicant on a case-by-case basis.

Additional functionality can be accepted by the NoBo following the standard procedure for "additional functions".

5. Miscellaneous ETCS and GSM-R on-board limitations

For GSM-R, only compliance with the "MI" requirements is in scope for the NoBo. Non-compliance with "M" or "O" requirements is not relevant and does not need to be presented as a limitation. However, not implementing certain "M" requirements might indirectly lead to "MI" requirements not being fulfilled. Therefore, care should be taken.

According to EIRENE FRS chapter 4.1.4 "*Mobile equipment... shall function as specified when travelling at speeds from 0 km/h to 500 km/h.*" In most cases, lower speed is sufficient. So, this would be a typically condition of use, because this is an MI requirement.

No other limitations are identified at the moment.

6. ETCS trackside levels

The trackside can be equipped with a national ATP system, with ETCS level 1, 2 or 3, with a combination of them, or not at all (level 0). So no limitations are identified here. Note that in case of national ATP (class B) systems or of level 0, national procedures for placing in service apply and 'EC' Verification is not required.

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7. ETCS trackside modes

Modes are defined for the on-board, not for trackside. The CCT subsystem of a railway line can command several modes to the on-board, depending on the characteristics of the track and possibly on degraded situations. No limitations are currently identified here. However, an EC certificate for an ETCS trackside (CCT) Subsystem shall only be issued when FS mode or LS mode and all implemented trackside modes can be operated by a train that is equipped with a TSI conform ETCS on-board of the corresponding baseline.

8. ETCS trackside interfaces

The acceptability of interfaces not being implemented is given in this table. For the RBC interfaces, it is assumed that levels 2 or 3 are implemented in the trackside:

Interface not implemented	Agreement	Rationale
Functional interface between RBCs (§ 4.2.7.1)	'EC' certificate with Conditions and Limits of Use	Acceptable for 'stand-alone' RBC or grouped RBC
Technical interface between RBCs (§ 4.2.7.2)	'EC' certificate with Conditions and Limits of Use	Acceptable for 'stand-alone' RBC or grouped RBC
Interface between GSM-R and RBC (§ 4.2.7.3)	Refuse to issue an 'EC' certificate	This interface is essential for level 2 or 3 communication
Interface between (switchable) Eurobalise and LEU (§ 4.2.7.4)	Refuse to issue an 'EC' certificate (for Eurobalise or LEU)	In case of separate Interoperability Constituents: the interface is essential for functioning
	'EC' certificate (for grouped Eurobalise and LEU)	In case of grouped Interoperability Constituents: application of the harmonised interface is optional
Interface between Euroloop and LEU (§ 4.2.7.5)	Refuse to issue an 'EC' certificate (for Euroloop or LEU)	In case of separate Interoperability Constituents: the interface is essential for functioning
	'EC' certificate (for grouped Euroloop and LEU)	In case of grouped Interoperability Constituents: application of the harmonised interface is optional

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Interfaces to other subsystems (§ 4.3)	< No recommendation >
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9. Miscellaneous ETCS and GSM-R trackside limitations

Function not implemented	Agreement	Rationale
IC Eurobalise: Only designed/checked for the CW Telepowering mode and not for the Toggling/Non-toggling Telepowering modes (points 1 and 2 of Clause 5.2.2.9 of Subset-036-v3.1.0).	'EC' certificate with Conditions and Limits of Use	Acceptable for railway lines where the on-board BTM equipment only operates in CW mode and the BTM interoperability/compatibility with KER balises is not required

No other limitations are identified at the moment.

THIS RFU WAS AGREED ON

PLENARY MEETING 63

THIS RFU ENTERS INTO FORCE ON

18/11/2021

FROM THIS DATE ON THIS RFU CAN BE APPLIED INSTEAD OF THE PREVIOUS MANDATORY VERSION.

RFU APPLICATION IS MANDATORY STARTING FROM

18/11/2021

RFUs SHALL BE APPLIED BY ALL NOBOS. PLEASE REFER TO RFU-STR-702, CHAPTER 3 OF THE SECTION "DESCRIPTION AND BACKGROUND EXPLANATION", FOR THE LEGAL BASIS SUPPORTING THIS OBLIGATION.

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ERA COMMENTS

PLE 063 – 10/11/2021:

Document not reviewed by ERA due to the ongoing revision of CCS TSI.

Clarifications to Conformity Assessment Bodies on the topic addressed by this RFU will be managed through the CCM process if requested by NB Rail as Representative Body and provided in the next revision of CCS TSI or in the related Application Guide.

The content of this RFU does not apply to any next revision of the CCS TSI. It will be evaluated and updated accordingly.

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