**TITLE**

CERTIFICATES WITH RESTRICTIONS AND CONDITIONS FOR USE

| **ORIGINATOR** | **SUBJECT RELATED TO** |
| --- | --- |
| ALTRAN, CERTIFER, SINTEF, VŮŽ | SUBSYSTEM CCO AND CCT |

**DESCRIPTION AND BACKGROUND EXPLANATION**

**Introduction**

Manufacturers of ERTMS equipment 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, this is legally allowed.

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. Examples are not implementing functionality on-board, when it is not implemented in the network where the vehicle is intended to run, 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 can not be validated, because the interface can't be tested. Full compliance with the requirements cannot be proven, so 'full' certification will be impossible. Nevertheless, it can be fully justified to place such Subsystem into service.

This requires, however, that the certificates and technical files provide all information related to the corresponding restrictions and conditions of use. It has to be stated that it is the responsibility of the Member State to authorise such a Subsystem to be placed in service and that it is the duty of the NoBo to ensure that the technical file is complete in the sense of what was mentioned before.

This RFU gives guidance on the certification of CCS Interoperability Constituents and Subsystems by Notified Bodies, when there is not a full compliance with all requirements from the TSI CCS.

**Legal basis**

The Railway Interoperability Directive 2008/57/EC gives 4 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. 18 – clause 5),
2. if allowed in a transitional period specified in the TSI (this case is not applicable

for CCS),

3. if a derogation has been granted (art. 9) and
4. in case of partial application of TSIs for upgrade or renewal (art. 20).

In the first case, the TSI CCS specifies the scope and parameters (and therefore the scope of verifications) for the allowed parts. No decision of a Member State is required here. In the latter 2 cases, a decision by the Member State(s), where the Subsystem will be operated, 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 VI) that in all these cases, *the "EC" certificate shall give the precise reference to the TSI(s) or their parts whose conformity has not been examined by the notified body during the "EC" verification procedure.*

This is further clarified in the TSI CCS. This TSI states is article 6.4.3:

- A partial certificate of conformity for an <u>interoperability constituent</u> can be issued even if some function, interface or performance has not been implemented;

- When the interoperability constituent is integrated into a Control-Command and Signalling On-board or Track-side <u>Subsystem</u>, … , the certificate shall indicate which requirements have been assessed and shall state the corresponding restrictions on the use of the subsystem and its compatibility with other subsystems.

### 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 and some of them prevent full TSI compliant on-board equipment from normal operation or from being compatible with the trackside. In these cases, the Notified Body shall refuse a certificate.

### Alignment of approaches

In order to align their approaches, the Notified Bodies for the Control-Command and Signalling subsystems of the trans-European rail system 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 (2) 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 deviations. The higher level acceptance criterion shall always be met. The list of specific deviations is comprehensive but not exhaustive. Deviations that are not listed may be acceptable if the higher level criterion is met.

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

### Special case: pre-fitted On-Board or Trackside Subsystems

As a first step of a migration strategy, a Railway Undertaking or a manufacturer may equip a vehicle or an Infrastructure Manager may equip a section of line with a set of Interoperable Constituents which are partially or fully compliant with the TSI CCS, but without performing the full ERTMS functionalities.

An example is an on-board assembly with an EVC and one or more STMs. All the hardware is installed, but the on-board assembly does not offer ETCS functionality (levels 1, 2 or 3). The only functionality may be the speed indication to the driver, interfacing with the train (brakes) and/or managing the STM(s). Another example is a section of line equipped with Eurobalises and LEU, where only national system messages (packet 44) are implemented and no ETCS messages.

These on-board or trackside assemblies can be seen as partial compliant CCS Subsystems, for which the 'EC' Verification procedure should be applied. However, they can also be seen as class B system(s), for which the national procedures for placing in service apply (see section 5.6 of Recommendation 2011/217/EU).

'EC' Verification by a Notified Body can have advantages when the on-board or trackside assembly will be upgraded to full ETCS functionality in a later stage. When in a later migration step more or full ETCS functionality is added, the 'EC' Verification can build upon the initial Verification. It makes little sense to start an 'EC' Verification of the on-board or trackside fitment when the equipment has been in operation for several years. For instance, most checks that are listed in table 6.2 of the TSI CCS can be done or should be done when the equipment is installed in the vehicle.

However, there is a wide variety of technical solutions for such first migration steps. These have to be analysed on a case by case basis. In some cases, the best option would be that the NoBo issues a Certificate of Verification with Restrictions and Conditions for Use, in other cases an ISV and sometimes an "assessment report for interoperability". In all cases, the NoBo shall indicate unambiguously which TSI requirements were already checked, and judge which are compliant and which are not compliant at this stage.

In case the on-board or trackside assembly is regarded as a partially compliant CCS On-board or Trackside Subsystem, this can be accepted by the NoBo, when the acceptance criterion on the level of Essential Requirements is met. This RFU does not (yet) give guidance on specific deviations. These have to be analysed case by case.

### Additional notes

The restrictions and conditions for use shall be mentioned in section 9 of the certificate (see RFU-STR-001). Details should be given in the technical file (a technical file is mandated for Subsystems, but is also recommended for Interoperability Constituents).

Restrictions and conditions for 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 restrictions and conditions for use in its 'EC' Declaration of Conformity (for Interoperability Constituents; see Annex IV of Directive

2008/57/EC) or in its 'EC' Declaration of Verification (for Subsystems; see Annex V of the amended Directive 2008/57/EC).

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

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

In the tables below, a justification is given for the Recommendation. This is a justification why, in general, a certificate with restrictions and conditions for use can be issued or should be refused. Note that the assessment of the actual compatibility between trackside and on-board Subsystems is not in the scope of the NoBo but is in the scope of the Railway Undertaking's Safety Management System..

## 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 restrictions and conditions for 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).

### Specific Deviations

Above acceptance criterion is detailed further for the 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 recommended, especially when there is a combination of deviations. 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 GSM-R (radio communication) and train detection parts of ERTMS, currently no deviations are foreseen.

ETCS on-board levels

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

| Level not implemented | Recommendation | Justification |
| --- | --- | --- |
| Level STM (baseline 2) / NTC (baseline 3) | 'EC' certificate with restrictions and conditions for use | Can safely be operated on Class A lines |
| Level 0 | 'EC' certificate with restrictions and conditions for 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 'EC' certificate | This is not an ETCS system (note that pre-fitting is not regarded in these tables) |
| Level 1, while level 2 is implemented | 'EC' certificate with restrictions and conditions for use | Can safely be operated on level 2 infrastructure |
| Level 1, while level 3 is implemented | 'EC' certificate with restrictions and conditions for use | Can safely be operated on level 3 infrastructure |
| Level 2 (and 3) | 'EC' certificate [with restrictions and conditions for use] | Can safely be operated on level 1 infrastructure. For Subsystems, this may not be a deviation from TSI CCS clause 2.3 |
| Level 2, while level 3 is implemented | 'EC' certificate with restrictions and conditions for use | Can safely be operated on level 1 and level 3 infrastructure |
| Level 3 | 'EC' certificate | This is not a deviation from the TSI CCS |

ETCS on-board modes

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

| Mode not implemented | Recommendation | Justification |
| --- | --- | --- |
| ISOLATION | 'EC' certificate [with restrictions and conditions for use] | This functionality may be realised outside the EVC |

**RECOMMENDATION FOR USE**

**RFU-CCS-077**

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| NO POWER | Refuse 'EC' certificate | Essential for functioning |
| SYSTEM FAILURE | Refuse 'EC' certificate | Essential for functioning |
| SLEEPING | 'EC' certificate with restrictions and conditions for use | Acceptable for single engines |
| STAND BY | Refuse 'EC' certificate | Essential for functioning |
| SHUNTING | 'EC' certificate with restrictions and conditions for use | Can safely be operated on Class A infrastructure where Shunting mode is not implemented<br><br>Not essential when not used by the Railway Undertaking |
| FULL SUPERVISION | 'EC' certificate with restrictions and conditions for use | In case mode 'Limited Supervision' is implemented on-board and the vehicle is intended for running on LS lines only |
| | Refuse 'EC' certificate | In other cases: safety critical in level 1, 2 or 3 |
| UNFITTED | 'EC' certificate with restrictions and conditions for use | Acceptable when level 0 is not implemented; can safely be operated on Class A or Class B infrastructure |
| STAFF RESPONSIBLE | Refuse 'EC' certificate | Essential mode for level 1, 2 or 3 operation |
| ON SIGHT | 'EC' certificate with restrictions and conditions for use | Can safely be operated on Class A infrastructure where On Sight mode is not implemented (however this is unlikely) |
| TRIP | Refuse 'EC' certificate | Safety critical mode |
| POST TRIP | 'Refuse 'EC' certificate | Essential for operation |
| NON LEADING | 'EC' certificate with restrictions and conditions for use | Acceptable when tandem operation is not desired by the applicant |
| STM European (SRS version 2.3.0 | 'EC' certificate with restrictions and | Acceptable when a European STM is not applied (note that there is no |

| only) | conditions for use | complete set of specifications allowing STM European actually to be implemented) |
|---|---|---|
| STM National | 'EC' certificate with restrictions and conditions for use | Acceptable when level STM is not implemented and/or when no STM will be attached |
| REVERSING | 'EC' certificate with restrictions and conditions for use | Can safely be operated on Class A infrastructure where Reversing mode is not implemented |
| LIMITED SUPERVISION (SRS baseline 3 only) | 'EC' certificate with restrictions and conditions for use | Can safely be operated on Class A infrastructure where Limited Supervision mode is not implemented. |
| PASSIVE SHUNTING (SRS baseline 3 only) | 'EC' certificate with restrictions and conditions for use | Acceptable when not desired by the applicant |

ETCS on-board interfaces

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

| **Interface not implemented** | **Recommendation** | **Justification** |
|---|---|---|
| Interface to STM (§ 4.2.6.1) | 'EC' certificate with restrictions and conditions for 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 restrictions and conditions for 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 '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 | Refuse 'EC' | Essential interface |

# RECOMMENDATION FOR USE

**RFU-CCS-077**

**CO-ORDINATION BETWEEN NOTIFIED BODIES**
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| DMI (§ 4.2.13/12)[1] | certificate | |
| Interface to data recording (§ 4.2.15/14)[2] | Refuse 'EC' certificate | Essential interface |
| Interfaces to other subsystems (§ 4.3) | <No recommendation> | |

Change requests

The IC or Subsystem 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; it is unlikely that functionality isn't implemented. Acceptability is basically possible, but it has to be demonstrated by the applicant on a case by case basis. The NoBo shall regard them as "additional functions".

Miscellaneous ETCS and GSM-R on-board deviations

No other deviations are identified at the moment.

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 deviations 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.

ETCS trackside modes

Modes are defined for the on-board, not for trackside. The trackside basically can command several modes to the on-board, depending on the characteristics of the track. No deviations 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.

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 trackside:

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[1] § 4.2.13 in 2006/679/EC; § 4.2.12 in 2012/88/EU.
[2] § 4.2.15 in 2006/679/EC; § 4.2.14 in 2012/88/EU.

| Interface not implemented | Recommendation | Justification |
|---|---|---|
| Functional interface between RBCs (§ 4.2.7.1) | 'EC' certificate with restrictions and conditions for use | Acceptable for 'stand alone' RBC or grouped RBC |
| Technical interface between RBCs (§ 4.2.7.2) | 'EC' certificate with restrictions and conditions for use | Acceptable for 'stand alone' RBC or grouped RBC |
| Interface between GSM-R and RBC (§ 4.2.7.3) | Refuse 'EC' certificate | This interface is essential for level 2 or 3 communication |
| Interface between Eurobalise and LEU Eurobalise (§ 4.2.7.4) | Refuse '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 Euroloop (§ 4.2.7.5) | Refuse '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 |
| Interfaces to other subsystems (§ 4.3) | < No recommendation > | |

Miscellaneous ETCS and GSM-R trackside deviations

No other deviations are identified at the moment.

**DATE OF AGREEMENT AT NB RAIL PLENARY MEETING**

07/05/2014