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NB-Rail Association

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-040

Issue 04

Date 19/06/2024

TITLE

ASSESSMENT OF THE IC RBC AND ITS INTEGRATION INTO THE TRACKSIDE SUBSYSTEM

ORIGINATOR

Certifer & Altran UK (up to issue 02)
TÜV SÜD Nederland BV, Certifer, Arsenal
Race (issue 03)
TÜV SÜD Nederland BV (issue 04)

SUBJECT RELATED TO

TSI CCS (2012, 2015, 2016, 2019,
2020, 2023 versions)

AMENDMENT RECORD:

Issue 02: Contents improved and aligned to the CCS TSI 2016

Issue 03: Focus on aspects of RBC certification which are not fully addressed by the legal baseline; removal of requirements not relevant for RBC certification or explicitly defined within the legal baseline

Issue 04: Formal updates to include CCS TSI 2023. No changes in the required assessment activities.

DESCRIPTION AND BACKGROUND EXPLANATION

The RBC is defined as Interoperability Constituent (IC n°1) by the TSI CCS Table 5.2.a (up to TSI CCS version 2020) and Table 5.2 (TSI CCS version 2023).

Therefore, the certification of such IC aims at certifying a *generic*¹ component to be integrated in different trackside subsystems.

On the other hand, the characteristics and hence the requirements to be assessed as required in Table 5.2.a / Table 5.2 by reference to chapter 4 points to:

- *specific* or *not harmonised* requirements or *not standardised* interfaces, as recalled in the TSI application guide GUI/CCS TSI/2020 (“Special considerations RBC”);
- requirements which apply in principle to IC RBC and trackside subsystem.

Therefore, the functions implemented in an RBC depend on its integration with the trackside CCS subsystem and with the trackside signalling. This is further detailed in the following, per characteristic.

RAMS

/1/ **Quantitative target calculation of RBC depends on mission profile and related assumption** - The calculation of the quantitative target (THR/TFFR) depends (also) on the specific conditions for use including the limits of the

¹ In the context of this RFU, the terms “generic” and “specific” are used according to CENELEC EN 50129 (standard from TSI CCS Table A 3).



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functional and performance validation as addressed by chapter “Mission profile and Related Assumption” of Subset-091.

Trackside ERTMS/ETCS functionality

Among the applicable indexes, Subset-026 (hereinafter referred as “SRS”) and Subset-091 apply to both the ICs and the Trackside Subsystem.

/2/ Requirements in SRS not explicitly allocated to RBC and Trackside subsystem - The SRS classifies (on chapter 9) the ETCS on-board requirements and the ETCS trackside requirements, while it doesn't separate the RBC requirements and the subsystem requirements. In consequence the requirements allocated to the RBC (and hence relevant for the RBC certification) as Interoperability Constituent must be argued from the description of the RBC functionality in chapter 2.5 of SRS and from the wording of the requirements alongside the SRS. As the main task of the RBC is the elaboration of the messages to be sent to the train on basis of information received from external signalling systems and on basis of information exchanged with the on-board subsystems, the core-function to be implemented by the RBC – and hence to be certified - is the ETCS language.

/3/ Tests of RBC functions depend on a specific set of data, interfaces and environmental conditions - The test of RBC functionality is only possible with a set of data (based on specific track configuration as addressed by Mission profile of Subset-091), with certain interfaces and under certain environmental conditions.

Interfaces

/4/ Some RBC functions depend on not standardised interfaces - Some of the RBC interfaces defined in Figure 1 of Subset-026-2, i.e. interface with Interlocking and with Control Centre, are not standardised, so the RBC certification is linked to specific interfaces.

/5/ Some RBC functions may depend on additional interface(s) - The RBC may implement additional interface(s) (e.g. for Temporary Speed Restrictions).

Environmental conditions

/6/ RBC environmental conditions not explicitly identified - Clause 4.2.16 of TSI CCS says that the environmental conditions specified in the documents listed in Appendix A, Table A 2 of the TSI shall be respected, while the applicable specifications (indexes) of table(s) A 2 cannot be derived from Table A 1.

RFU PROPOSAL



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The NoBo shall assess the RBC as Interoperability Constituent and its integration in the Trackside Subsystem as described in the following table, with reference to the assessment aspects identified in TSI CCS,

- Table 6.1 (for TSI CCS up to version 2020) or Table 6.1.1 (for TSI CCS version 2023) for ICs, and
- Table 6.3 for trackside subsystem.

(This RFU is not substituting the requirements in tables 6.1 / 6.1.1 & 6.3 but it is limited to the assessment of the topics /1/ to /6/ described above).

IC RBC assessment scope	Trackside subsystem assessment scope
/1/ Quantitative target calculation of RBC depends on mission profile and related assumptions	
a. Aspect "RAMS" of Table 6.1 / 6.1.1- The IC RBC does identify the mission profile used for quantitative target calculation. Corresponding SRACs (Safety related application conditions) shall be exported as needed to the Trackside Subsystem level.	Aspect "RAMS" of Table 6.3 - The Trackside Subsystem is aligned with the mission profile. If the set of data significantly differ from the assumptions stated in section 10.2 of Subset-091 an analysis of the impact of the deviating parameters must then be made.
/2/ Requirements in SRS not explicitly allocated to RBC and Subsystem	
b. Aspect "Functions, interfaces and performance" of Table 6.1 / 6.1.1 - The IC RBC does give proof of compliance to the requirements of the ERTMS language as identified in Subset-026. In details for Subset-026 chapter 7 and 8, it shall provide evidence for the boundary values and resolution of the variables defined in a range, and for the special/reserved values. The RBC shall make clear whether values outside the allowed range / values are rejected during the configuration.	Aspect "Use of interoperability constituents" of Table 6.3 - The Trackside Subsystem complies with the configuration rules defined at RBC level.
c. Aspect "Functions, interfaces and performance" of Table 6.1 / 6.1.1 – The IC RBC does identify (for example by means of compliance/traceability matrixes) the TSI requirements implemented at IC level. Note: It is important for the Trackside CCS subsystem NoBo to know which requirements are fulfilled on IC level to avoid gaps or double assessment.	Aspect "Use of interoperability constituents" of Table 6.3 - The Trackside Subsystem implements the requirements exported to subsystem level.



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<p>In case TSI requirements are to be fulfilled both, by IC RBC and by subsystem, they shall be explicitly exported to the trackside CCS subsystem integrating the IC RBC.</p>	
<p>d. Aspect “RAMS” of Table 6.1 / 6.1.1 – The IC RBC does implement a generic data preparation process which complies with the CENELEC requirements defined in EN 50128. Configuration rules and/or values to be implemented at subsystem level are exported as SRACs.</p>	<p>Aspect “Integration with trackside signalling” of Table 6.3 - The Trackside Subsystem takes into account the configuration rules defined at RBC level, the data are implemented in the RBC according to the rules and according to the specific characteristics of the line.</p> <p>The SRACs defined by the RBC are considered.</p>
<p>e. Aspect “RAMS” of Table 6.1 / 6.1.1 - The IC RBC does implement a development process which complies with the CENELEC requirements defined in EN 50126, EN 50128 and EN 50129. Rules to be implemented at subsystem level are exported as SRACs.</p>	<p>Aspect “Integration with trackside signalling” of Table 6.3 - The Trackside Subsystem takes into account the development rules defined at RBC level.</p> <p>The SRACs defined by the RBC are considered.</p>
<p>/3/ Tests of RBC functions depend on a specific set of data, interfaces and environmental conditions</p>	
<p>f. Aspect “Functions, interfaces and performance” of Table 6.1 / 6.1.1 - The IC RBC does identify the limits (e.g. maximum speed, gradients etc) used for testing.</p>	<p>Aspect “Integration with Control-Command and Signalling On-board Subsystems and rolling stock: tests under conditions representing the intended operation” of Table 6.3 - The Trackside Subsystem complies with the limits used for testing of RBC. If not, proper tests shall be executed as clause “tests already done in different steps”² cannot be considered.</p>
<p>g. Aspect “Functions, interfaces and performance” of Table 6.1 / 6.1.1 - The IC RBC does identify the standardised interfaces used for testing and reports the corresponding certificates. For not standardised interfaces see next point.</p>	<p>Aspect “Integration with Control-Command and Signalling On-board Subsystems”³ of Table 6.3 - The Trackside Subsystem executes integration tests.</p>
<p>/4/ Some RBC functions depend on not standardised interfaces</p>	

² Described as “tests already carried out at different stages” / “tests already carried out at earlier stages” in TSI CCS versions older than 2023.

³ Described as “Integration with Control-Command and Signalling On-board Subsystems and with rolling stock in TSI CCS versions older than 2023.



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h. Aspect “Functions, interfaces and performance” of Table 6.1 / 6.1.1 - The IC RBC does identify the non-standardised interfaces considered for design and used for testing. The requirements for the interfaces in terms of exchanged variables and timings are made clear.

Aspect “Integration with Trackside Signalling” of Table 6.3 - The Trackside Subsystem checks the requirements defined at RBC level for the non-standardised interfaces, in particular IXL, and defines dedicated integration tests in nominal and degraded modes.

/5/ Some RBC functions may depend on additional interface(s)

i. Aspect “Functions, interfaces and performance” of Table 6.1 / 6.1.1 - The IC RBC does identify the additional interface(s) considered for design and used for testing and provides Impact analysis.

Aspect “Integration of interoperability constituents in the subsystem” and “Integration with Trackside Signalling” of Table 6.3 - The Trackside Subsystem integrates the same additional interface(s) used at RBC level; if not, impact analysis shall be executed at subsystem level.

/6/ RBC environmental conditions not explicitly identified

j. Aspect “Construction of equipment” of Table 6.1 / 6.1.1 - The IC RBC does provide evidence of compliance to the environmental conditions as identified in the following:

See the following bullets.

- Index 27 (Subset-091) requires that the defined targets shall be achieved in a specified environment (temperature, vibration, Electromagnetic Interference (EMI) etc.) according to the indications in the applicable Technical Specification for Interoperability, see the following bullets (no detailed requirements in Index 27).

None (assessment for this task is completed at IC level).

- Index 34 (A11T6001), electrical properties for the IGSM interface.

None (assessment for this task is completed at IC level).

- The precise values and / or classes regarding the environmental conditions (e.g. for altitude, temperature etc.) shall be explicitly identified. This should be done using the harmonised standard EN 50125-3.

Aspect “Use of interoperability constituents” of Table 6.3 - The Trackside Subsystem’ characteristics and environment comply with the conditions exported by the RBC. if not, impact analyses shall be executed at subsystem level.

The above identified properties, requirements and conditions in column “IC RBC assessment scope” shall be mentioned in the ‘EC’ certificate of conformity (or accompanying documents) for the IC RBC.



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The above identified requirements and conditions in column “Trackside subsystem assessment scope” shall be mentioned in the ‘EC’ certificate of verification / ISV (or accompanying documents) for the CCS trackside subsystem.

THIS RFU WAS AGREED ON

PLENARY MEETING 071 – 19/06/2024

THIS RFU ENTERS INTO FORCE ON

15/07/2024 (DATE OF PUBLICATION)

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

RFU APPLICATION IS MANDATORY STARTING FROM

15/07/2024 AT THIS DATE ANY PREVIOUS VERSIONS OF THIS RFU WILL BE WITHDRAWN.

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.

ERA COMMENTS

PLE 071 – 19/06/2024: NO COMMENTS PROVIDED