RCA

Reference CCS Architecture

An initiative of the ERTMS users group and the EULYNX consortium

RCA Documentation Plan

Document ID: RCA.Doc.6

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1 Preamble

1.1 Release Information

Basic document information:

RCA-Document Number: RCA.Doc.6

Document Name: RCA Documentation Plan

Cenelec Phase: N/A

Version: 1.1

Approval date: 2022-10-19

1.2 Imprint

Publisher:

RCA (an initiative of the ERTMS Users Group and EULYNX Consortium)

Support and Feedback:

For feedback, or if you have trouble accessing the material, please contact rca@eulynx.eu.

1.3 Disclaimer

No disclaimer defined.

1.4 Purpose

This document lists, identifies and defines all documents of the RCA (reference CCS architecture).

The document contains:

- An overview of the document categories used in RCA
- A list of all documents developed by RCA, i.e. the documentation plan

2 Version history

Version	Date	Author	Description
Gamma.1	2020-01-31	B. Rytz	Ready for publication after review RCA core group
0.1 (0.A)	2020-09-11	M. Blazic	Updated document list for BL0 R1, sync introduction section setup
0.2 (0.A)	2021-02-04	M. Blazic	Updated document list for BL0 R1 update
0.3 (0.A)	2021-04-16	M. Blazic	Concepts for Digital map and Plan Execution added Realization of RCA goals added
0.4 (0.A)	2021-07-02	N. Huurman	Updated document list for BL0 R2
0.5 (0.A)	2021-09-03	M. Blazic	Architectural Design Concept Plan Execution added
0.5 (0.A)	2021-11-29	P. Moosmann	Updated document list for BL0 R3
0.6 (0.A)	2022-04-19	D. Iacopino	Updated document list for BL0 R4
1.0	2022-09-30	M. Reimann	Updated document list for BL1 R0
1.1	2022-10-19	M. Reimann	Minor formal changes.

3 Related documents

- The “RCA Release notes” [RCA.Doc.5] describe the relevant documents (according to this documentation plan) for a given release.

4 Structure of the documentation plan

4.1 Document attributes

The documentation plan uses the following attributes for every document:

Id	A unique identifier for the document of the form RCA.Doc.XXX where XXX is a decimal number without special meaning.
Category	See description below
Type	Distinguish between • Doc = Document • MB = Model-based • Dia = Diagram
Name	Name of the document
CENELEC	CENELEC phase(s) (if applicable)
First published	Release in which the document was first published. May be “Planned”, when document is not yet published.
Comment	Important information, e.g., that the document is obsolete or has been superseded by other document.

As soon as formal change control is in effect (to be defined in Change Control Management process [RCA.Doc.39], the handling of versions/releases/baselines will be specified in more detail.

4.2 Documentation categories

The documentation plan for RCA includes different categories of documents with differing needs of formality and change control. The following table describes the defined categories:

Category	Purpose	Content (examples)	Degree of formality
A. RCA system specification	Model-based specification in accordance with ARCH (refer to RCA.Doc.33). Gives a reference to CENELEC phases, for which these documents will be used as input to produce a specification in accordance with CENELEC-compatible system development.	formalised system, function, component, interface specification	High: formalised, modelled, formal QA, formal change-control (CC) in CCB

B. Concept development	Concepts describe ideas and solution concepts in the problem space and serve as input to later system specifications. However, concepts are not (yet) suitable for system specification (maturity, formality), any reference to CENELEC phase must be seen as contribution to the phase performed later in system development.	RCA effects, migration paths for RCA users, principles of the safety logic, capability-based protocols	Low-to-medium: free-form, QA and CC by RCA core group
C. Mission and Process description	Description of how the RCA process is organised	Process overview, modelling guidelines	Medium: free-form, QA and CC by RCA core & strategy group
D. Communication support	Material to explain RC and to create awareness	FAQ, presentations, films	Low: free-form, informal QA
E. Demonstrators	Support development by concrete experiments Showcase RCA	RCA demonstrator planned for InnoTrans	(for InnoTrans) Low: free-form, informal QA
X. eXternal documents	Documents provided/ prepared by other working groups, but which (on mutual agreement) are included in an RCA release.	Documents on localisation from the LWG (Localisation Working Group).	See B. Concept development

Each document/artefact of the documentation plan is classified according to these categories.

Note on the relationship between categories «A. System specification» and «B. Concept development»:

- A given topic (e.g., modular safety or platform independence) is expected to start in «concept development» and to transition to «system specification» if and only if it is
  - needed for the formal specification and
  - mature enough (shared understanding achieved, efficient work process in formal environment)
- Such topics will typically end up in the «domain knowledge» or in the «generic … requirements» part of the «system specification»

- In some cases, the treatment of a topic may remain distributed over documents both in «concept development» and in «system specification» if they differ in the need for formality (an example might be some architectural design principles).

5 List of main RCA documents

The following documents are released as part of BL1 R0. This list comprise the valid and up to date set of documents.

ID, Version	Cat	Type	Document Name	Description	CENELEC Phase(s)	First published	Last update
RCA.Doc.6 Version 1.1	D	Doc	RCA Documentation Plan	List of all documents in this release	N/A	Gamma	BL1 R0
RCA.Doc. 14 Version 1.1	A	MB	RCA Terms and Abstract Concepts	Definition of all terms used in RCA.	N/A	Gamma	BL1 R0
RCA.Doc. 82 Version 1.1	A	MB	System Needs Analysis	Analysis of the system needs.	2,4,5	Gamma	BL1 R0
RCA.Doc. 52 Version 1.0	B	MB	APS Detailed concepts overview	Introduction to detailed concepts documents	1	BL1 R0	BL1 R0
RCA.Doc. 60 Version 1.1	B	MB	Explanation of ARCH Process, Methods, Rules	Explanation of the architecture process applied in RCA	1	BL0 R4	BL0 R4
RCA.Doc. 61 Version 1.0	B	Doc	APS Concept Operating State and APS Domain Objects	Operating state and domain objects; geometric representation; relation to MAP model; abstract concepts	1	BL1 R0	BL1 R0

ID, Version	Cat	Type	Document Name	Description	CENELEC Phase(s)	First published	Last update
RCA.Doc. 63 Version 1.0	B	Doc	APS Concept Movement Permission	Train protection: Parts of MP; life cycle; safety checks; scenarios; relation of MA/signalling and MP	1	BL1 R0	BL1 R0
RCA.Doc. 67 Version 1.0	B	Doc	APS Concept Movable Object	Taxonomy of movable objects; life cycle; object aggregation	1	BL1 R0	BL1 R0
RCA.Doc. 70 Version 1.0	B	Doc	Concept: SCI-CMD	Concept for the interface SCI-CMD	1	BL1 R0	BL1 R0
RCA.Doc. 79 Version 1.0	B	Doc	Position Paper Level Crossings	Position Paper	N/A	BL1 R0	BL1 R0
RCA.Doc. 80 Version 0.2	A	MB	System feature definition	Definition of system features and its variants to manage mutually exclusive system aspects and to stage the development	2	BL1 R0	BL1 R0
RCA.Doc. 81 Version 0.2	A	MB	Functional decomposition	Decomposition of system level capabilities and system functions on logical level.	2	BL1 R0	BL1 R0
RCA.Doc.5 Version 1.0	D	Doc	RCA Release Notes	Description of current release of RCA deliverables.	0	Alpha	BL1 R0

ID, Version	Cat	Type	Document Name	Description	CENELEC Phase(s)	First published	Last update
RCA.Doc.7 Version Beta.1	D	Doc	RCA FAQ	Frequently asked questions and answers regarding RCA. Useful for a quick overview.	N/A	Alpha	BL1 R0
RCA.Doc. 31 Version 1.5	B	Doc	Concept: SCI-OP	Concept for the Standardized System Interface - Operational Plan	1	Gamma	BL1 R0
RCA.Doc. 33 Version 0.4	C	Doc	Concept: Methods and Tooling: Arch Process	Describes the methods and tools used for developing the RCA specification.	N/A	BL0 R3	BL0 R4
RCA.Doc. 40 Version 1.0	X	Doc	RCA Architecture Poster	Illustrative, high level architecture overview of RCA.	N/A	Alpha	BL1 R0
RCA.Doc. 46 Version 1.1	B	Doc	Concept: Digital Map	Provide a complete conceptual view of the Digital Map, its main scope, principles, environment, functional and non-functional requirements, etc.	1	BL0 R2	BL1 R0
RCA.Doc. 47 Version 0.4	B	Doc	Concept: Plan Execution	System concept of SubSys Plan Execution.	1	BL0 R2	BL1 R0

ID, Version	Cat	Type	Document Name	Description	CENELEC Phase(s)	First published	Last update
RCA.Doc. 49 Version 0.3	B	Doc	Concept: Architectural Design Plan Execution	Describes the architectural design of SubSys Plan Execution.	1	BL0 R3	BL1 R0
RCA.Doc. 50 Version 0.6	B	Doc	A.P.M business targets and strategy	Describes the strategy of the A.P.M. part of RCA and business re-quirements.	1	BL0 R3	BL1 R0
RCA.Doc. 51 Version 1.0	B	Doc	Concept: APS	Solution principles, objectives and requirements.	N/A	BL0 R4	BL1 R0
RCA.Doc. 53 Version 0.6	A	Doc	A.P.M objectives	Objectives (high level requirements) list for A.P.M.	1	BL0 R3	BL1 R0
RCA.Doc. 54 Version 0.3	B	Doc	Concept: MAP (Overall Solution Concept)	Describes the solution concepts for the overall Map process from preparation until activation of Map Data.	1	BL0 R4	BL0 R4
RCA.Doc. 55 Version 1.0	B	Doc	Digital Map Business Case	Provides a short overview of the content of the Digital Map and presents its business case.	1	BL0 R3	BL0 R3

ID, Version	Cat	Type	Document Name	Description	CENELEC Phase(s)	First published	Last update
RCA.Doc. 56 Version 1.1	B	Doc	Digital Map Evaluation Onboard Map	Provides a detailed evaluation of different approaches on provision-ing of Map Data from trackside to on-board.	1, 2	BL0 R3	BL0 R3
RCA.Doc. 57 Version 0.3	B	Doc	Digital Map Evaluation Reference Model	Provides a detailed evaluation of different reference models used to represent topology.	1, 2	BL0 R3	BL0 R3
RCA.Doc. 58 Version 0.5	B	Doc	Digital Map Preliminary Hazard Analysis	Provide the results of Preliminary Hazard Analysis (PHA) of the Digi-tal Map.	3	BL0 R4	BL0 R4
RCA.Doc. 59 Version 1.0	B	Doc	Digital Map System Definition	Provides the basic system level understandings, boundaries, de-tailed functionalities, interfaces, Life-cycle aspects etc.	2	BL0 R4	BL1 R0
RCA.Doc. 62 Version 1.0	B	Doc	APS Concept Route setting and route protection	Route protection: Setting of field elements; flank protection; (level crossings)	1	BL1 R0	BL1 R0
RCA.Doc. 66 Version N/A	B	Doc	System Architecture Specification / System Usage Documentation	Description of the Overall System Architecture and System Usage	N/A	N/A	N/A

ID, Version	Cat	Type	Document Name	Description	CENELEC Phase(s)	First published	Last update
RCA.Doc. 68 Version 0.7	B	Doc	LWG Concept: Track Occupancy Overall Solution Concept	No description defined.	1	BL1 R0	BL1 R0
RCA.Doc. 69 Version 1.0	B	Doc	MAP Object Catalogue	Defines and describes the Object Model used to provide reliable and validated topology and topography data in the form of Map Data	1-4	BL0 R4	BL1 R0
RCA.Doc. 72 Version 0.5	B	Doc	ATO Concept	Description of the automatic train operation	1	BL1 R0	BL1 R0
RCA.Doc. 73 Version 3.0	B	Doc	Concept ATO Execution	System concept of SubSys ATO Execution	1	BL1 R0	BL1 R0
RCA.Doc. 74 Version 1.0	B	Doc	Concept SMI	Concept for the Standardized Maintenance Interface.	1	BL1 R0	BL1 R0
RCA.Doc. 75 Version 0.1	B	Doc	IPM Concept	Concept for Incident Prevention and Management.	1	BL1 R0	BL1 R0
TWS03-10 Version 1.1	X	Doc	White paper: An Approach for a Generic Safe Computing Platform for Railway Applications	Whitepaper for Computing Platform	N/A	BL1 R0	BL1 R0

ID, Version	Cat	Type	Document Name	Description	CENELEC Phase(s)	First published	Last update
TWS03-20 Version 3.1	X	Doc	Generic Safe Computing Platform High-Level Requirements	Requirements for Computing Platform	N/A	BL1 R0	BL1 R0
TWS03-30 Version 2.0	X	Doc	Specification of the PI API between Application and Platform	Definition of Computing Platform API	N/A	BL1 R0	BL1 R0
RCA.Doc. 77 Version 0.2	B	Doc	MAP Quality Framework	No description defined.	1-x	BL1 R0	BL1 R0
RCA.Doc. 78 Version 0.3	B	Doc	Position Paper Shared Services	Describes the principle and a basic concept of Shared Services for RCA.	N/A	BL1 R0	BL1 R0

6 List of released supporting documents

The following documents are released as part of BL1 R0. These documents have not been updated and they are potentially out of date. However they are deemed as supporting documents for the understanding of RCA.

ID, Version	Type	Document Name	Description	CENELEC Phase(s)	First published	Last update
RCA.Doc.1 Version N/A	Doc	RCA White Paper	The rationale for starting RCA. Foundation for MoU between EUG and EULYNX.	0	Alpha	Alpha
RCA.Doc.3 Version Gamma.1	Doc	RCA Process Overview	How the RCA group works to prepare, maintain and bring the RCA specification to the sector.	0	Alpha	Gamma
RCA.Doc.8 Version Beta.1	Doc	Concept: Modular Safety	A modular architecture requires and enables concepts to reduce the safety workload.	N/A	Beta	Beta
RCA.Doc. 10 Version Gamma.1	Doc	Concept: RCA Effects - Business Case	The economic effects (savings) of an RCA-based implementation, based on smartrail 4.0 and extrapolated to other IMs.	N/A	Gamma	Gamma
RCA.Doc. 12 Version Beta.1	Doc	Concept: RCA Effects - Capacity	The effects on traffic capacity for an RCA-based system.	N/A	Beta	Beta

ID, Version	Type	Document Name	Description	CENELEC Phase(s)	First published	Last update
RCA.Doc. 13 Version Gamma.1	Doc	Concept: Architectural approach / System-of-systems perspective	Architectural principles for the RCA.	N/A	Beta	Gamma
RCA.Doc. 28 Version 1.2	Doc	Migration	Illustrates how migration towards an RCA-based system can be planned, including examples of different IMs.	N/A	Gamma	BL0 R2
RCA.Doc. 29 Version Gamma.1	Doc	Concept: LSL - Enhanced L3, Supervision, Localisation	Evolution of ETCS, rationale for submitted TSI CRs.	N/A	Gamma	Gamma
RCA.Doc. 32 Version Gamma.1	Doc	Concept: Degraded modes	The role of degraded modes in specifying RCA.	N/A	Gamma	Gamma
RCA.Doc. 35 Version 0.3	Doc	RCA System Architecture	Definition of the RCA System Architecture.	2, 4, 5	BL0 R1	BL0 R2

ID, Version	Type	Document Name	Description	CENELEC Phase(s)	First published	Last update
RCA.Doc. 37 Version Gamma.1	Doc	Concept: RCA effects overview	Overview of potential the effects / benefits of an RCA-based system.	0	Gamma	Gamma
18E112 Version 2.0	Doc	LWG: Railways Localisation System HL Users' Requirements	Provided by the Localisation Working Group of the EUG.	N/A	Gamma	Gamma
RCA.Doc. 41 Version N/A	Doc	Declaration of Intent by DB, NR and SBB	Public statement on contribution to RCA.	N/A	Beta	Beta
RCA.Doc. 45 Version 2.0	Doc	(Cyber) Security Guideline	A guideline to and definition of a harmonized Security Risk Assess-ment for System Design process.	2	BL0 R1	BL0 R1
RCA.Doc. 48 Version 1.0	Doc	Realization of RCA goals	Description of the goals and objectives of RCA.	N/A	BL0 R2	BL0 R2
N/A Version 0.9	Doc	Concept Paper MDM-Cluster	Describes the conceptual ideas of the MDM-Cluster.	N/A	N/A	BL1 R0
Eu.Doc.15 Version 2.0 (0.A)	Doc	EULYNX Security Concept	Definition of the security requirements on concept level for the whole EULYNX architecture, including communication interfaces and system components themselves as well as required processes.	N/A	N/A	BL1 R0

ID, Version	Type	Document Name	Description	CENELEC Phase(s)	First published	Last update
Eu.Doc.114 Version 1.0 (0.A)	Doc	EULYNX Security Specification	Definition of the security requirements on specification level for the whole EULYNX architecture, including communication interfaces and system components themselves as well as required processes.	N/A	N/A	BL1 R0
Eu.Doc.115 Version 1.0 (0.A)	Doc	EULYNX Security Parameter Specification	Definition of the security requirements for the parameters referenced in the EULYNX Security Specifications [EU.Doc. 114].	N/A	N/A	BL1 R0
Eu.Doc.116 Version 1.0 (0.A)	Doc	EULYNX Security Threat and Risk Analysis	Threat and risk analysis based on the EULYNX Security Concept [Eu.Doc.15] and with that the defined system under consideration.	N/A	N/A	BL1 R0

7 Dependencies

The documents within this baseline are based on the following configured artefacts:

Artifact	Version	Description
Model title	RCA	Capella model, acts as a source of truth for documentation within this baseline release
Model branch	master	
Capella version	5.2.0	