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Bundesministerium  
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Innovation und Technologie

## RAIL FREIGHT CORRIDOR 1 NSA WORKING GROUP

### GUIDELINE FOR CCS AUTHORISATION ON RAIL FREIGHT CORRIDOR 1

Version : 1.0

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## Rail Freight Corridor 1 NSA Working Group

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Version	Date	Section number	Modification/description	Author
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**1. References, terms and abbreviations**

**1.1. Reference input documents**

Document reference	Title	Version
<b>European documents</b>		
Interoperability Directive 2008/57/EC	The Interoperability Directive 2008/57/EC on the interoperability of the rail system within the Community (repealing Directives 96/48/EC and 2001/16/EC)	17 June 2008, last amended by Directive 2013/9/EU on 11 March 2013
Recommendation 2011/217/EU	Commission Recommendation on the authorisation for the placing in service of structural subsystems and vehicles under Directive 2008/57/EC (ex DV29)	29 March 2011
CSM Regulation 352/2009/EC (CSM RA)	Commission Regulation on the adoption of a common safety method on risk evaluation and assessment as referred to in article 6(3)(a) of Directive 2004/49/EC	24 April 2009
CSM Regulation 402/2013/EU (CSM RA)	Commission Implementing Regulation on the common safety method for risk evaluation and assessment and repealing Regulation (EC) No 352/2009/EC	30 April 2013 <sup>1</sup>
Safety Directive 2004/49/EC	Directive 2004/49/EC of the European Parliament and of the Council on safety of the Community's railways	29 April 2004, last amended by Directive 2009/149/EC on 27 November 2009
Decision 2012/88/EU (TSI CCS)	Commission Decision on the technical specification for interoperability relating to the control-command and signalling subsystems of the trans-European rail system (repealing Decisions 2006/679/EC and 2006/860/EC)	25 January 2012, last amended by decision 2012/696/EU on 06 November 2012 <sup>2</sup>
Decision 2009/965/EC	Commission Decision on the Reference Document referred to in Article 27(4) of Directive 2008/57/EC	30 November 2009
Decision 2011/155/EU	Commission Decision on the publication and management of the Reference Document referred to in Article 27(4) of Directive 2008/57/EC	9 March 2011
RefDoc Application Guide	Part 1 of the Reference Document envisaged by Article 27 of the Railway Interoperability Directive – Application Guide	(published version not dated)
NLF Flowcharts	Part 3 of the Reference Document – NLF flowcharts for vehicle authorisation	(latest version)
Subset-110/-111/-112	ss-110: UNISIG Interoperability Test – Guidelines ss-111: Interoperability Test Environment Definition (contains 5 parts: General, FFFIS for TCL-OBU Adaptor, FFFIS for TCL-RBC Adaptor, FFFIS for TCL-RBS Adaptor, FFFIS for TCL-RIU Adaptor) ss-112: UNISIG Basics for Interoperability Test Scenario Specifications  These documents are public and can be obtained from UNISIG	v 1.1.0 of 22 October 2012 (all parts)

<sup>1</sup> Mandatory from 21 May 2015

<sup>2</sup> Introducing ETCS Baseline 3

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Document reference	Title	Version
	<b>Rail Freight Corridor 1</b>	
	Corridor A MoU signed on June 7 <sup>th</sup> 2007	7 June 2007
	Corridor A common declaration	26 May 2009
	Rotterdam declaration of transport ministries (B, CZ, F, D, I, Lith, L, NL, P, CH)	14 June 2010
	EC introduction to the new TEN-T multi-modal transport network (introducing the new multi-modal corridors) <sup>3</sup> <a href="http://ec.europa.eu/transport/themes/infrastructure/news/ten-t-corridors_en.htm">http://ec.europa.eu/transport/themes/infrastructure/news/ten-t-corridors_en.htm</a>	17 October 2013

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<sup>3</sup> *The Core Network Corridor (CNC) Rhine-Alpine is almost identical with the Rail Freight Corridor (RFC) 1. ERTMS Corridor A is part of it. The RFCs are the railway backbones of the multi-modal CNCs.*



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**1.2. Terms and abbreviations**

Abbreviation	Term	Reference
APS	Authorisation for Placing in Service	Directive 2008/57/EC Art. 15 and ch. V, Recommendation 2011/217/EU ch. 5.1
CCS	(TSI) Control-Command and Signalling	<a href="http://www.era.europa.eu/Core-Activities/Interoperability/Pages/TSI-Application-Guide.aspx">http://www.era.europa.eu/Core-Activities/Interoperability/Pages/TSI-Application-Guide.aspx</a>
CoC	'EC' Certificate of Conformity	Directive 2008/57/EC Art. 11.2 and Art. 18.5
CoV	'EC' Certificate of Verification	Directive 2008/57/EC Annex VI.3
CR	Conventional Rail (system)	<a href="http://www.era.europa.eu/Core-Activities/Interoperability/Pages/TSI-Application-Guide.aspx">http://www.era.europa.eu/Core-Activities/Interoperability/Pages/TSI-Application-Guide.aspx</a>
CSM (RA)	Common Safety Methods (on Risk Assessment)	Regulation 352/2009/EC, replaced by 402/2013/EU
CSM AsBo	Assessment Body	Regulation 352/2009/EC Art. 3 (14)
D1, D2, ...	Documents (results of activities of a stage)	Used in the tables of this Guideline
DeBo	Designated Body	Directive 2008/57/EC Art. 17(3); Recommendation 2011/217/EU ch. 8.6
--	Design Operating State	A technical state when a vehicle, subsystem or part of subsystem is performing a required function for which it has been designed, manufactured and tested. <sup>4</sup> Design operating state includes at least the nominal operating mode. Design operating state includes degraded operating modes, provided these modes have been designed, implemented and tested so that the essential requirements are met.
DoC	'EC' Declaration of Conformity (of interoperability constituents)	Directive 2008/57/EC Annex IV
DoV	'EC' Declaration of Verification (of subsystems)	Directive 2008/57/EC Annex V
EC	European Commission	
ECM	Entity in Charge of Maintenance	Directive 2008/57/EC Art. 2 (z), Directive 2004/49/EC Art. 3(t); Recommendation 2011/217/EU ch. 8.4
EMC	Electro-Magnetic Compatibility	
ENE	(TSI) Energy	<a href="http://www.era.europa.eu/Document-Register/Pages/HS-ENE-TSI.aspx">http://www.era.europa.eu/Document-Register/Pages/HS-ENE-TSI.aspx</a>
ETCS	European Train Control System	
ERA	European Railway Agency	Regulation 881/2004
ERTMS	European Rail Traffic Management System	

<sup>4</sup> No legal definition yet available but used in Directive 2008/57/EC Art. 2(q) and Recommendation 2011/217/EU for the technical state at the moment of APS, see also recommendation R16 in Annex III

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Abbreviation	Term	Reference
HS	High Speed (rail system)	<a href="http://www.era.europa.eu/Document-Register/Pages/HS-ENE-TSI.aspx">http://www.era.europa.eu/Document-Register/Pages/HS-ENE-TSI.aspx</a> , <a href="http://www.era.europa.eu/Document-Register/Pages/HS-RST-TSI.aspx">http://www.era.europa.eu/Document-Register/Pages/HS-RST-TSI.aspx</a>
IC	Interoperability Constituent	Directive 2008/57/EC Art. 2 (f), Decision 2012/88/EU ch. 5
IM	Infrastructure Manager	Directive 2004/49/EC Art. 3(b); Recommendation 2011/217/EU ch. 8.3
INF	(TSI) Infrastructure	<a href="http://www.era.europa.eu/Core-Activities/Interoperability/Pages/TSI-Application-Guide.aspx">http://www.era.europa.eu/Core-Activities/Interoperability/Pages/TSI-Application-Guide.aspx</a>
IRL	International Requirements List	<a href="http://www.rail-irl.eu">www.rail-irl.eu</a>
ISA	Independent Safety Assessor	NB-Rail RFU 2-000-16 of 01 April 2006
ISV	'EC' Intermediate Statement of Verification	Directive 2008/57/EC Annex VI, 2.2.1
LEU	Lineside Electronic Unit	Decision 2012/88/EU, 4.2.3
LOC&PAS	(TSI) Locomotives and Passenger rolling stock	<a href="http://www.era.europa.eu/Document-Register/Pages/TSI-Application-Guide-CR-LOC-and-PAS-TSI.aspx">http://www.era.europa.eu/Document-Register/Pages/TSI-Application-Guide-CR-LOC-and-PAS-TSI.aspx</a>
MS	(EU) Member State	Recommendation 2011/217/EU ch. 8.8  Note: in this Guideline, the term MS includes also Switzerland, as they adopt the European legislation on ERTMS in their national legal framework
NB-Rail	Co-ordination group of Notified Bodies for Railway products and systems	CIRCABC database; browse from <a href="https://circabc.europa.eu">https://circabc.europa.eu</a> via "NB-Net – Notified Bodies Network" to "NB-Rail"
--	Network	A network is a set of routes that use the same functions, engineering rules, requirements and conditions of use <sup>5</sup>
NLF	National Legal Framework	ERA Application Guide for part 3 of the Reference Document <a href="http://www.era.europa.eu/Core-Activities/Cross-Acceptance/Pages/Part-2-and-Part-3-of-the-Reference-Document.aspx">http://www.era.europa.eu/Core-Activities/Cross-Acceptance/Pages/Part-2-and-Part-3-of-the-Reference-Document.aspx</a>
NoBo	Notified Body	Directive 2008/57/EC Art. 2(j); Recommendation 2011/217/EU ch. 8.5
NOI	(TSI) Noise	<a href="http://www.era.europa.eu/Document-Register/Pages/CR-Noise-TSI.aspx">http://www.era.europa.eu/Document-Register/Pages/CR-Noise-TSI.aspx</a>
NR	National Rule(s)	Directive 2008/57/EC Art. 17.3  <i>Note: "National Rule" ("NR") is used in this Guideline as the equivalent term for rules that are national, notified and technical according to art. 17.3</i>
NSA	National Safety Authority	Directive 2008/57/EC Art. 2 (v), Directive 2004/49/EC Art. 16; Recommendation 2011/217/EU ch. 8.7
Odo	Odometry	

<sup>5</sup> Definition introduced for the purpose of this Guideline. This is an extension to the definition in Directive 2008/57/EC Art. 2 (d).

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Abbreviation	Term	Reference
OPE	(TSI) Operation	<a href="http://www.era.europa.eu/Core-Activities/Interoperability/Pages/TSI-Application-Guide.aspx">http://www.era.europa.eu/Core-Activities/Interoperability/Pages/TSI-Application-Guide.aspx</a>
OTS	Operational Test Scenario	Decision 2012/88/EU ch. 6.1.2, ERA ERTMS/ETCS test format for operational testing version 1.2 of 24/05/2011
P1, P2, ...	Preconditions (for activities of a stage)	Used in the tables of this Guideline
PRM	(TSI) Persons with Reduced Mobility	<a href="http://www.era.europa.eu/Document-Register/Pages/PRM-TSI.aspx">http://www.era.europa.eu/Document-Register/Pages/PRM-TSI.aspx</a>
RBC	Radio Block Center	Decision 2012/88/EU ch. 4.2.3
RFC 1	Rail Freight Corridor 1	<a href="http://www.corridor1.eu">http://www.corridor1.eu</a>
RFU	Recommendation For Use	A RFU is a document for INTERNAL USE within NB Rail, recording questions, issues or concerns and the agreed answers (see NB-Rail)
RINF	Register of Infrastructure	Recommendation 2011/217/EU ch. 6
RIU	Radio Infill Unit	Decision 2012/88/EU ch. 4.2.3
RST	(TSI) Rolling Stock	<a href="http://www.era.europa.eu/Document-Register/Pages/HS-RST-TSI.aspx">http://www.era.europa.eu/Document-Register/Pages/HS-RST-TSI.aspx</a>
RU	Railway Undertaking	Directive 2004/49/EC Art. 3(c); Recommendation 2011/217/EU ch. 8.2
--	Safe Integration	The action of making sure that the integration of a structural subsystem in a system will have no adverse effect on the safety of that system during operation <sup>6</sup>
--	Satisfy itself	German: sich überzeugen dass Dutch: ervan overtuigd zijn dat Italian: convincersi, persuadersi
SMS	Safety Management System	Directive 2004/49/EC Art. 2 (i)
SRAC	Safety Related Application Conditions	Rules, conditions and constraints relevant to functional safety which need to be observed in the application of the system/sub-system/equipment (EN 50129, B.5)
SRT	(TSI) Safety in Railway Tunnels	<a href="http://www.era.europa.eu/Document-Register/Pages/SRT-TSI.aspx">http://www.era.europa.eu/Document-Register/Pages/SRT-TSI.aspx</a>
SS	(structural or functional) Subsystem	Directive 2008/57/EC intro (26), Art. 2 (e), Annex II
STM	Specific Transmission Module	Decision 2012/88/EU ch. 6.2.4.2
T1, T2, ...	Task (activity of a stage)	Used in the tables of this Guideline
TC	Test Case	ERTMS/ETCS test format for operational testing version 1.2 of 24/05/2011
--	Technical Compatibility	A property of two or more structural subsystems which have at least one common interface, to interact with each other while maintaining their individual design operating state and their expected level of performance <sup>7</sup>
TSI	Technical Specification for Interoperability	Directive 2008/57/EC intro (12)

<sup>6</sup> Definition adopted from ERA discussion paper "CSM RA and APS" v 1.0 of 01/02/2013. No legal definition yet available.

<sup>7</sup> Definition adopted from ERA discussion paper "CSM RA and APS" v 1.0 of 01/02/2013. No legal definition yet available.

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<b>Abbreviation</b>	<b>Term</b>	<b>Reference</b>
TTSV	Track-Train System Validation	Introduced for the purpose of this Guideline
UNISIG	Union Industry of Signalling (industrial consortium, assoc. member of UNIFE)	<a href="http://www.ertms.net/ertms/about-unisig.aspx">www.ertms.net/ertms/about-unisig.aspx</a>
WG	Working Group	

Note: All definitions according to Directive 2008/57/EC, Art. 2 are also valid for this Guideline.

## **2. Introduction**

### **2.1. Objective of this Guideline**

2.1.1. On 26 May 2009, the Dutch, German, Swiss and Italian Ministers asked the National Safety Authorities with the support of EC/ERA, notified bodies, IMs and industry to develop a common process for authorising the placing in service of CCS systems on the Corridor A<sup>8</sup> railway infrastructure and vehicles.

The aim is to create transparency and efficiency to all the parties involved related to the authorisation process.

2.1.2. This Guideline is intended to describe a common approach for authorisation which is taking into account the current quality/maturity level of specification and products.

2.1.3. It is considered that vehicle authorisation is complex, that it has cross border impact and the greatest potential for cost reduction, e.g. by process harmonisation and cross acceptance.<sup>9</sup> This potential has also been acknowledged in the Copenhagen MoU of 2012.

### **2.2. Scope of this Guideline**

2.2.1. This Guideline is primarily focussing on the authorisation activities related to the on-board CCS subsystem as part of the vehicle authorisation. Trackside authorisation is also considered in the overall framework.<sup>10</sup>

2.2.2. The Guideline follows the European approach as laid down in the Interoperability Directive 2008/57/EC. However, as the Interoperability Directive 2008/57/EC enables some freedom of interpretation. In which steps are necessary to ensure technical compatibility and safe integration, some special arrangements for Rail Freight Corridor 1 have been agreed on. They will be described in the subsequent chapters.<sup>11</sup>

2.2.3. Based on the European framework, this Guideline describes the roles and responsibilities within the authorisation process for the CCS subsystem. In particular this Guideline addresses what has to be done for the on-board CCS part of the vehicle authorisation by the NSAs of Rail Freight Corridor 1 and Austria.

2.2.4. This Guideline reflects the understanding of the Rail Freight Corridor 1 NSA Working Group and what is considered to be the right way forward.

2.2.5. This Guideline is applicable in the RFC 1 Member States (Belgium, Germany, Italy, The Netherlands and Switzerland) and Austria.

### **2.3. Structure of this Guideline**

2.3.1. Chapter 3 gives a general overview of the system, process and involved parties.

2.3.2. Chapters 4, 5, 6, 7 and 8 are related to on-board / vehicle authorisation. Chapter 5 is describing the details regarding the authorisation process to be applied for a first authorisation. Chapter 6 is about what to do if new, additional and subsequent authorisations are requested.

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<sup>8</sup> At that time it referred to Corridor A

<sup>9</sup> It is recognised that some time trackside realisations will remain different, e.g. because of the underlying Class B and signalling systems. Nevertheless, activities have started to reduce unnecessary trackside differences (elaboration of engineering guidelines, database of operational test cases).

<sup>10</sup> The infrastructure managers of Corridor Rhine-Alpine have stated in the Progress Report of the Executive Board of August 2011 of that they are not able to deliver a harmonised customer requirement specification for the ETCS-infrastructure on Corridor A. The benefit of one harmonised process for the placing in service of the infrastructure is not given any more. This fact has led to the change of the focus of the Corridor Rhine-Alpine NSA ERTMS Working Group towards the definition of a harmonised process for the on-board CCS subsystem as part of the vehicle authorisation.

<sup>11</sup> Border crossing authorisation issues related to short penetration will be handled in a separate paper

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- 2.3.3. Annex I lists CCS related contents that are expected to be found in the set of technical documents handed over to the NSA for vehicle authorisation.
- Annex II gives considerations how the amount of testing can be reduced.
- Annex III lists recommendations related to the authorisation process, which would help to streamline the application of the European legal framework but could not be solved in the frame of the NSA working group.
- Annex IV shows how IMs can support the testing approach of this Guideline.
- Annex V gives recommendations on the use of languages.
- Annex VI is related to the certification of ICs. However, this is not in the scope of the NSAs and given here for completeness.
- Annex VII is related to authorisation of trackside subsystems. However, this is not in the scope of this Guideline and given here for completeness.
- Annex VIII is related to network access and operation, which is outside the scope of authorisation.

### **3. Overview**

#### **3.1. The essential requirements**

3.1.1. The Railway Interoperability Directive 2008/57/EC requires that the subsystems and the interoperability constituents including interfaces meet the essential requirements set out in general terms in Annex III to the Directive.

3.1.2. The essential requirements are:

- 1) Safety,
- 2) Reliability and availability,
- 3) Health,
- 4) Environmental protection,
- 5) Technical compatibility.
- 6) Accessibility<sup>12</sup>

3.1.3. The essential requirements for Class A systems are described in Decision 2012/88/EU, Chapter 3. The requirements for Class B systems are in the responsibility of the relevant Member State having the obligation to notify these as a NR to the EC.

#### **3.2. Overview of the system**

3.2.1. The following scheme of the system (Figure 1) shows the different subsystems and the interfaces to be taken into account for integration and authorisation of a vehicle equipped with an on-board CCS subsystem. It highlights the subsystem CCS on-board, which is in the scope of this Guideline.

The colour code for both system overview and process overview is given in Figure 2.

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<sup>12</sup> *Accessibility has been introduced by Directive 2013/9/EU, amending the Interoperability Directive 2008/57/EC. However, it is not (yet) mentioned in Decision 2012/88/EU and will probably not be relevant for CCS subsystems.*

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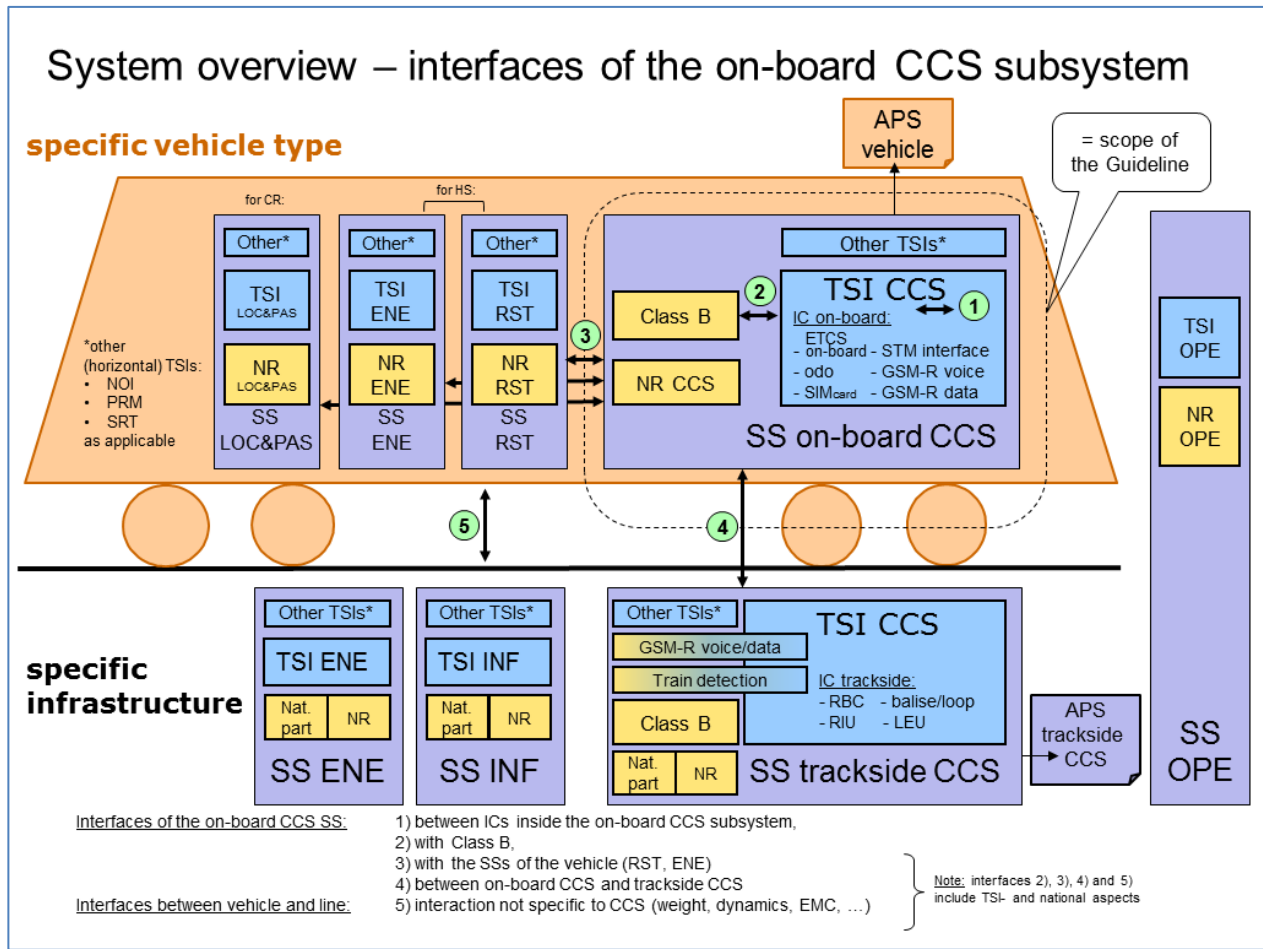


Figure 1: System Overview

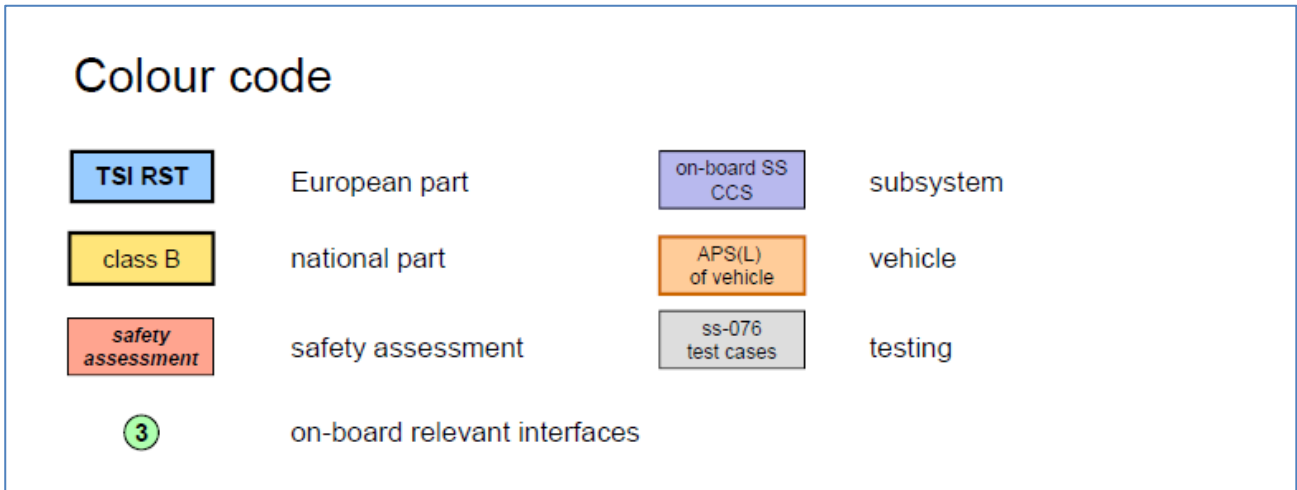


Figure 2: Colour Code

3.2.2. The essential requirements will be fulfilled based on rules laid down in TSIs (rules necessary to achieve interoperability with Class A systems), NRs and other standards, as shown in Figure 3.

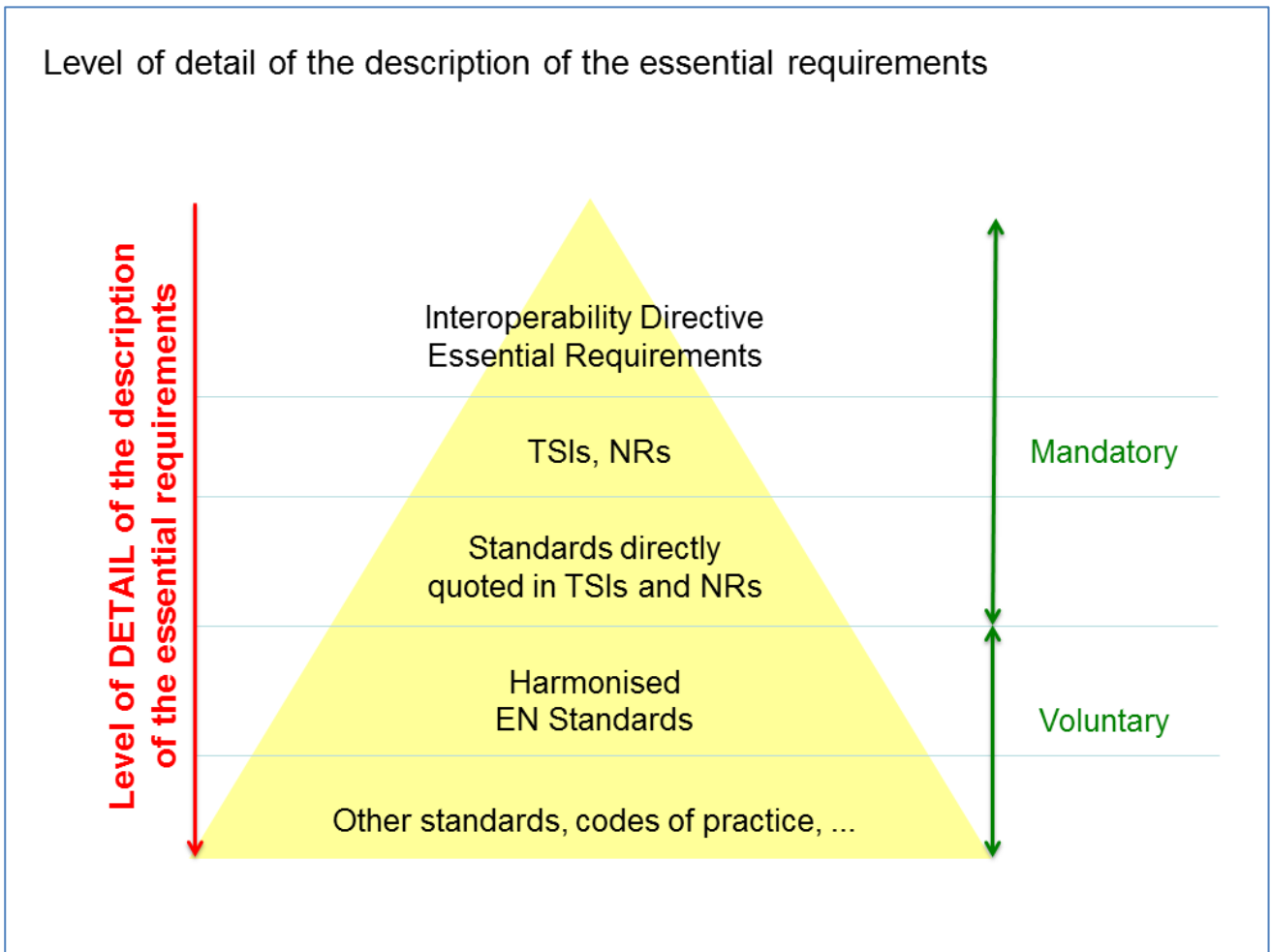
The part fulfilled by mandatory rules shall be certified by assessment bodies. The part fulfilled by voluntary rules shall be covered by the quality management systems of the manufacturer/applicant. The part fulfilled by voluntary rules will be taken into account by the assessment bodies to check the fulfilment of the essential requirements.



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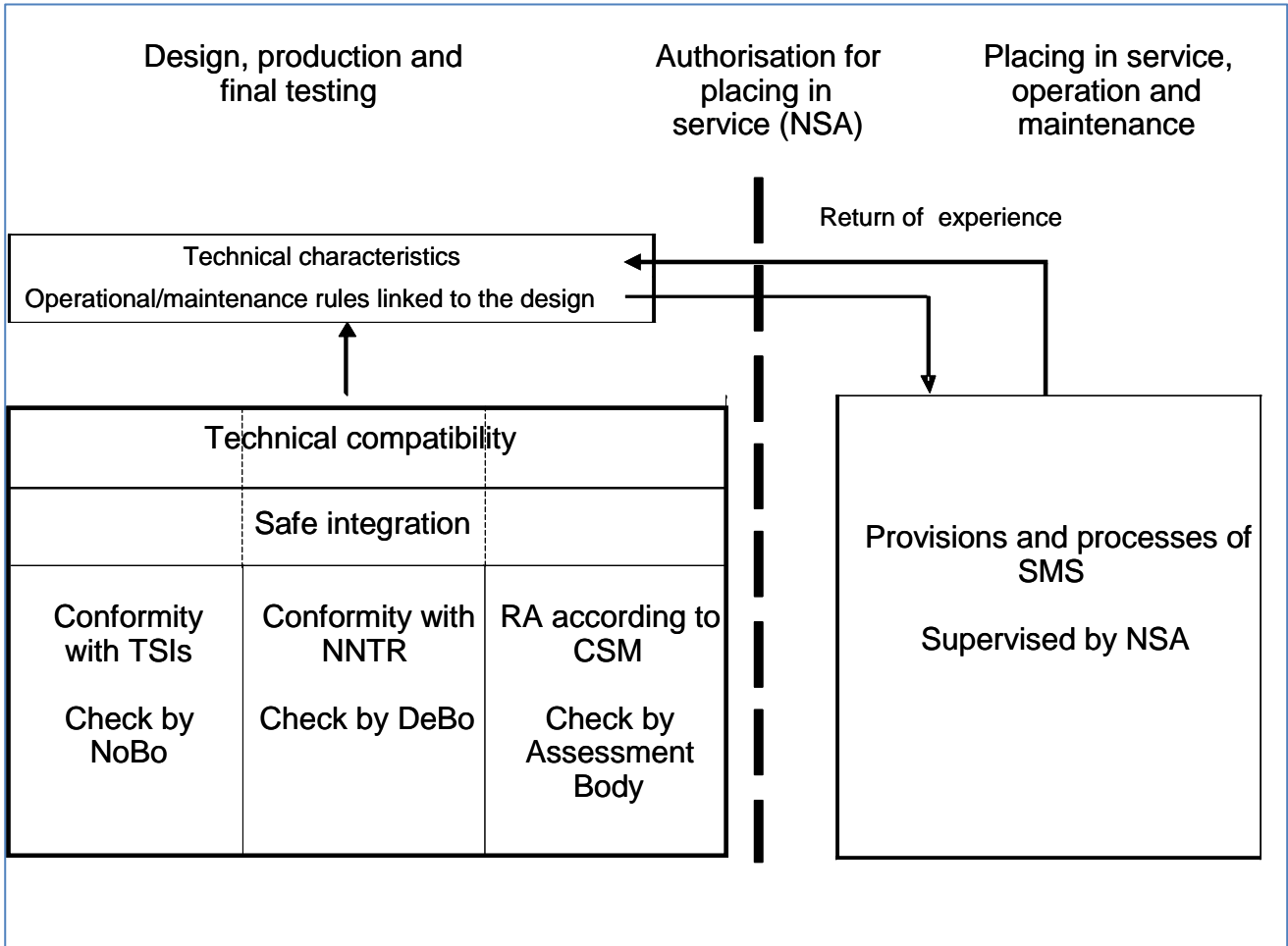
The fulfilment of all essential requirements shall be declared by the applicant when submitting the documents for authorisation.



*Figure 3: Level of detail of the description of the essential requirements*

**3.3. Overview of the authorisation process**

3.3.1. From a general point of view Directive 2008/57/EC regulates the technical characteristics (mainly design, production, and final testing) of the subsystems and vehicles and the process of their authorisation for placing in service and Directive 2004/49/EC regulates the entities that use, operate and maintain them, as shown in Figure 4.



*Figure 4: Boundary between APS, operation and maintenance according to Recommendation 2011/217/EU<sup>13</sup>*

3.3.2. Figure 5 shows a possible schematic classification of milestones for vehicles and trackside equipment including related tests as used in this Guideline.

The overall process can be divided in four main stages, depicted as A, B, C and D. The Guideline focuses on stages B and C for the CCS on-board subsystem.

The colour code is given in Figure 2.

<sup>13</sup> “NNTR” in this figure corresponds to “NR” as used in this Guideline; “RA” is risk assessment according to Regulation 352/2009/EC respective 402/2013/EC

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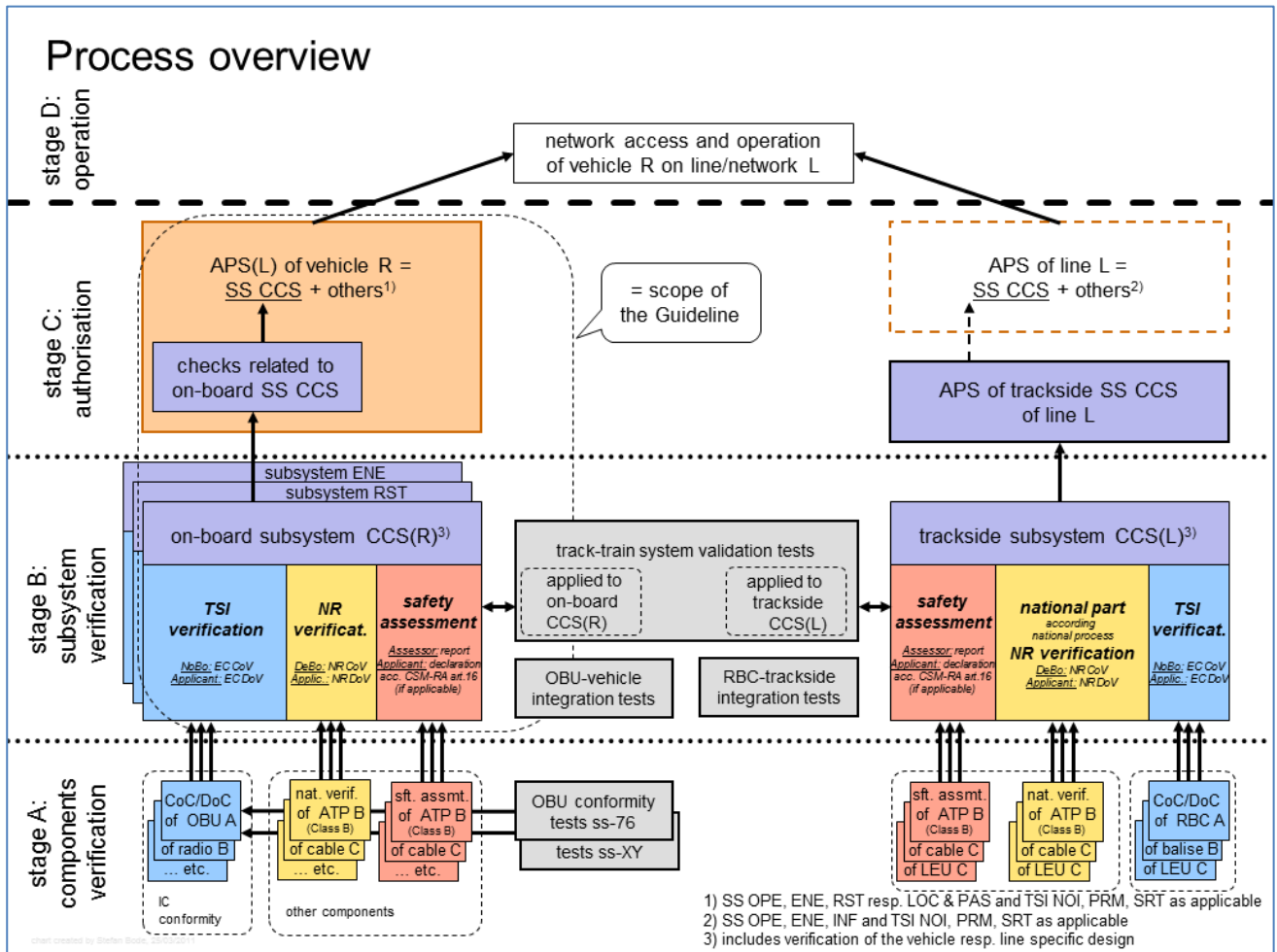


Figure 5: Overall process overview

3.3.3. Stage A: Components Verification

Certificates of conformity and declarations of conformity for ICs are not put into question during authorisation by the NSA. It is however relevant that any restriction and condition of use will be forwarded to the 'EC' verification process (see also Annex III, R6).

3.3.4. Stage B: Subsystem Verification

- The assessment bodies NoBo, DeBo, CSM AsBo (if applicable) assess the CCS subsystem as a whole, including the integration of the ICs within the CCS subsystem and the integration with the other vehicle subsystems and the trackside CCS subsystem.
- Track-train system validation (TTSV) tests are means for the applicant to provide evidence for technical compatibility<sup>14</sup> between on-board and trackside CCS subsystems related to the design operating state<sup>15</sup> of the trackside CCS subsystem and the vehicle. These tests shall be described in TSIs or, if not covered there, in National Rules. They shall be carried out under the appropriate (i.e. the networks where the system will be used) functional, technical, environmental and operational conditions. The applicant is responsible to ensure

<sup>14</sup> Definition of technical compatibility see chapter 1.2

<sup>15</sup> Definition of design operating state see chapter 1.2

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that the tests (lab/remote/site) or other means provide the evidence needed for authorisation.

Other vehicle authorisation cases (new, additional, renewed) may require a reduced effort, depending on the nature and amount of changes compared to the first authorisation. It remains in the responsibility of the applicant to define and provide the necessary assessments and related documentation.

### 3.3.5. Stage C: Authorisation

The NSA will grant authorisation based on the results of stage B and the checks according to Directive 2008/57/EC article 15 and chapter V.

The types must be registered in ERATV (European Register of Authorised Types of Vehicles).<sup>16</sup>

### 3.3.6. Stage D: Operation

This stage after APS is in the responsibility of the IM, RU and ECM, each for her part of the railway system.

Before the train can be taken into operation, the individual vehicles must be registered in NVR (National Vehicle Register).<sup>17</sup>

Return of experience will give input for future authorisations.

3.3.7. The overview figure also highlights the subsystem CCS on-board, which is in the scope of this Guideline.

3.3.8. The current national implementations of the European Process will be published as “national legal framework” (NLF) on the ERA website <http://www.era.europa.eu/Core-Activities/Cross-Acceptance/Pages/Part-2-and-Part-3-of-the-Reference-Document.aspx>.

The authorisation process for vehicles with CCS on-board should be NLF compliant.

## 3.4. **Overview of vehicle authorisation cases**

According to Directive 2008/57/EC and Recommendation 2011/217/EU, authorisation can be granted according to different cases.

The following cases have been developed and described in the generic NLF flowcharts (see ERA Application Guide for part 3 of the Reference Document):

- First authorisation for vehicle type/vehicle
- New authorisation for upgraded/renewed vehicle type/vehicle
- Additional authorisation for vehicle type/vehicle already authorised by an MS (on other networks or on parts of other networks)
- Renewed authorisation for a type authorisation that is not valid anymore (e.g. after change of TSI requirements, NRs, verification procedures)
- Subsequent authorisations of vehicles conforming to an authorised vehicle type (authorisation of vehicles of the same type)

## 3.5. **Overview of roles and responsibilities**

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<sup>16</sup> On ERATV, see also footnote in T8 of ch. 5.4.2

<sup>17</sup> On NVR, see also footnote in T1 of Annex VIII

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3.5.1. The roles and responsibilities of the actors during the authorisation process are described in the Directive 2008/57/EC, Directive 2004/49/EC and Recommendation 2011/217/EU.

The following table gives an overview. More details are given in chapter 8.

Role	Ref.	Remarks
Applicant for APS	Directive 2008/57/EC Art. 18.1; Recommendation 2011/217/EU ch. 8.1	Can be a manufacturer, RU, IM, vehicle keeper or other
RU	Directive 2004/49/EC Art. 3(c); Recommendation 2011/217/EU ch. 8.2	
IM	Directive 2004/49/EC Art. 3(b); Recommendation 2011/217/EU ch. 8.3	
ECM	Directive 2004/49/EC Art. 3(t); Recommendation 2011/217/EU ch. 8.4	
NoBo	Directive 2008/57/EC Art. 2(j); Recommendation 2011/217/EU ch. 8.5	
DeBo	Directive 2008/57/EC Art. 17(3); Recommendation 2011/217/EU ch. 8.6	
NSA	Directive 2004/49/EC Art. 16; Recommendation 2011/217/EU ch. 8.7	
MS	EU Member States; Recommendation 2011/217/EU ch. 8.8	CH is adopting the EU process in their national legislation
CSM assessment body (CSM AsBo)	Regulation 352/2009/EC Appendix; Recommendation 2011/217/EU ch. 8.9	The recast CSM Regulation 402/2013/EU contains also rules for accreditation / recognition of the CSM assessment body. The NSA may also act as CSM assessment body.

3.5.2. Assessment bodies NoBo, DeBo, safety assessor and CSM AsBo

- a) The NoBo is responsible for the aspects that are contained within the TSIs.
- b) The DeBo is responsible for the aspects that are contained within the National Rules.
- c) On vehicle level it is necessary to ensure that all essential requirements are met related to the vehicle design operating state.<sup>18</sup>

In case of significant change, the demonstration of compliance with the safety requirements is to be supported by independent assessment by a CSM assessment body (CSM AsBo) according to CSM Regulation 352/2009/EC resp. 402/2013/EU.

The tasks and roles of the assessment bodies are defined in CENELEC 50129, Directive 2008/57/EC and Regulation 352/2009/EC resp. 402/2013/EU.

3.5.3. ISA

“ISA” is a term introduced by NB-Rail into the railway domain to indicate a person able (according to competence and independence characteristics) to perform certain verification tasks to help a manufacturer/designer:

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<sup>18</sup> This could be done e.g. by the DeBo

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*“Hence, Safety, which is an essential requirement, may be assessed by an ISA which is not necessarily a Notified Body. Note that the scope of ISA assessment can be an IC, a subsystem, or a part of an IC or a subsystem such as an electronic board, software, or a sensor.”<sup>19</sup>*

The ISA is an option if the applicant wants to procure technical assistance but this is not mandatory for authorisation according to EU legislation. In any case, the safety assessment is in the responsibility of the applicant.

The ISA can also have a role in case of a non-significant change and as part of the CENELEC process.

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<sup>19</sup> *RFU 2-000-16 of 01 April 2006, introducing the term ISA and criteria for ISA acceptance for the railway domain; CENELEC only mentions safety assessment*

## **4. Main principles**

### **4.1. Legal background**

4.1.1. The Interoperability Directive 2008/57/EC sets the legal framework for the authorisation of subsystems and vehicles. Therefore, the Directive had to be transposed into national law by the Member States of the European Union.

The Interoperability Directive 2008/57/EC introduces the technical specifications for interoperability (TSI). The TSIs specify the essential requirements for each subsystem and the functional and technical specifications to be met by these subsystems and their interfaces.<sup>20</sup>

4.1.2. According to Directive 2008/57/EC article 15, “Member States shall take all appropriate steps to ensure that these subsystems may be placed in service only if they are designed, constructed and installed in such a way as to meet the essential requirements concerning them when integrated into the rail system.”

In particular, technical compatibility and safe integration of these subsystems shall be checked.

4.1.3. The Regulation 352/2009/EC on the adoption of a CSM on risk evaluation and assessment (replaced by Regulation 402/2013/EU which will enter into force 21 May 2015 repealing Regulation 352/2009/EC) describes the process of risk management the proposer has to implement in case of any change to the railway system.

4.1.4. The recommendation 2011/217/EU (also known as DV29) gives the principles and directions “on the authorisation for the placing in service of structural subsystems and vehicles under Directive 2008/57/EC”. Discussions are ongoing to solve issues that are not yet covered. A follow-up of this document (known as DV29bis) is under development.

### **4.2. Concept of the Guideline**

The signatories of the document propose to apply the following concept for the authorisation of vehicles with on-board CCS subsystem.<sup>21</sup>

4.2.1. The APS is intended to be valid on the network(s).

A network is a set of routes that use the same functions, engineering rules, requirements and conditions of use.

4.2.2. There will be no separate APS for the structural subsystem on-board CCS. The activities related to the CCS subsystem will be part of the overall APS for the vehicle.

4.2.3. For subsystems that are affected by the change of the CCS installation, new declarations of verification in the framework of the vehicle authorisation are required.

4.2.4. Directive 2008/57/EC mandates under Article 15.1 the use of the CSM Regulation 352/2009/EC (now replaced by 402/2013/EU) for safe integration of subsystems into the rail system.

Obtaining authorisation by an applicant is not a change to the railway system. Only when a vehicle/subsystem is used by an RU/IM under its SMS may the railway system possibly be considered to be changed.

Applicants shall provide, in the technical file, all the information necessary for any RU to make use of the vehicle type (including but not limited to the restrictions and conditions of use) and to apply the CSM Regulation 352/2009/EC resp. 402/2013/EU when planning to use a vehicle on a route.

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<sup>20</sup> As far as Decisions are concerned, also the TSIs have to be put in force by national law of the MS

<sup>21</sup> Considerations on trackside authorisation can be found in Annex VII

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- 4.2.5. Decision 2012/88/EU mandates under chapter 3.2.1 the use of CSM Regulation 352/2009/EC (now replaced by 402/2013/EU) to fulfil the essential requirement safety for CCS subsystems. For Class A, the application of subset-091 as a code of practice is mentioned.
- 4.2.6. The NSA takes the decision for APS of the vehicle based on the provisions described in Directive 2008/57/EC. The necessary information is assumed to be provided by the following documents issued by the applicant.
1. For each subsystem constituting the vehicle, the applicant declares that all essential requirements are met and submits the following documents:
    - ‘EC’ declaration of verification – based on the NoBo’s assessment
    - Declaration of conformity with National Rules – based on the DeBo’s assessment
    - An assessment report regarding the safe integration and technical compatibility in relation to the design operating state of the vehicle<sup>22</sup>
    - And in case of significant change<sup>23</sup>: declaration of the proposer as stated in Art. 16 of Regulation 402/2013/EU<sup>24</sup> – based on the safety assessment report of the CSM AsBo<sup>25</sup>
  2. Other documents to be provided for APS (for the CCS related part see Annex I)
- 4.2.7. According to Directive 2008/57/EC Art. 15(1) the Member State has to check technical compatibility and safe integration before subsystems may be placed in service.
- 4.2.8. Before APS can be granted, the proof of safe integration and technical compatibility related to the design operating state of the vehicle shall be provided by the applicant.
- In this Guideline, if not otherwise specified, safe integration and technical compatibility are related to the design operating state of the vehicle, subsystem or part of subsystem.
- 4.2.9. The applicant bears the full responsibility for the completeness, relevance and consistency of the declarations and the technical file.<sup>26</sup>
- 4.2.10. All relevant information, including restrictions and conditions of use, has to be provided in these documents.
- This includes all parameters which have been considered within the construction and authorisation of the vehicle and which have to be checked by the RU to ensure safe integration and technical compatibility before placing the vehicle in operation (see also Annex VIII – Operation).
- 4.2.11. All tests related to the generic network characteristics have to be done before authorisation. No additional tests shall be needed after APS to check route suitability. All information related to the use of the vehicle has to be explicit in the technical file.
- 4.2.12. The NSA checks if the process required by the national legal framework has been correctly applied.
- 4.2.13. During the authorisation process information shall be shared<sup>27</sup> on issues (e.g. from other projects) that might be relevant for the authorisation, such as:

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<sup>22</sup> Definition of safe integration, technical compatibility and design operating state see chapter 1.2

<sup>23</sup> See Annex III, R15

<sup>24</sup> Optional until Regulation 402/2013/EU comes into force (21 May 2015 according to Art. 20)

<sup>25</sup> All changes to the vehicle are covered by the Directive 2008/57/EC and the TSIs, only if the vehicle/subsystem is introduced into the railway system the Regulation 402/2013/EU has to be applied

<sup>26</sup> As long as the NLF still requires check of correctness, this check will also be a task of the NSA



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- known issues/problems from the subsystem under authorisation or parts of it (accidents, incidents, ...)
- known issues/problems with the involved bodies (accreditation, safety authorisation, safety certificate, complaints, ...)
- known issues/problems with the application of the process required by the national legal framework by the involved bodies

The NSA shall satisfy itself that the applicant has taken into account these above mentioned issues.<sup>28</sup>

4.2.14. In case of justified doubts the NSA may call third party verifications into question.

Justified doubts can be in particular

- if before APS for a subsystem or vehicle it becomes known to the NSA that for an already authorised subsystem, which is in its construction or functions comparable, the preconditions are fulfilled for the NSA to decide on supervision activities because of an anticipated concrete risk,
- if an information has been registered in the safety information system of the NSA,
- if the NSA has to decide for surveillance measures according to Art. 14 Par. 1 and 2 of Directive 2008/57/EC, or
- if the NSA has information on poor fulfilment of tasks of notified bodies, designated bodies or assessment bodies which are involved in the respective authorisation process.

In case of justified doubts the NSA has the right to request additional checks from the applicant.

4.2.15. As a basic principle, no restriction should be accepted for APS.

### 4.3. Consequences of the concept

4.3.1. The concept does imply several links and interfaces inside and outside the scope of the NSA. These connecting issues require a dedicated consideration which is not in the scope of this Guideline.<sup>29</sup>

4.3.2. In Annex III are listed recommendations to help streamline the process of APS.

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<sup>27</sup> The NSA can only share as much as legally possible information on issues (e.g. from other projects) that might be relevant for the authorisation. Confidential information shall not be shared.

<sup>28</sup> These checks are necessary for the NSA to ensure that "all appropriate steps" of Directive 2008/57 Art. 15.1 are taken

<sup>29</sup> This Guideline is a concept for authorisation. Therefore the following issues are not covered: market and railway supervision, recognition and accreditation of assessment bodies, processing of derogations from the TSI CCS, processing of NRs, financing and funding, support and supervision of interoperability and European harmonisation, referee function in case of divergent positions of interest groups, cross-acceptance

## 5. Main steps of the concept

### 5.1. Scope of this chapter

5.1.1. This Guideline is focusing on the on-board stages B and C of the overall process from design to operation. It does not introduce specific arrangements for the stages A and D and for the trackside process.

5.1.2. This chapter gives a detailed description of stages B and C (CCS on-board) for a first authorisation.<sup>30</sup>

To put the vehicle authorisation in a wider context,

- Stage A is described in Annex VI
- Stages B and C related to trackside are described in Annex VII
- Stage D is described in Annex VIII.

### 5.2. Stage B: 'EC' verification of the on-board CCS subsystem

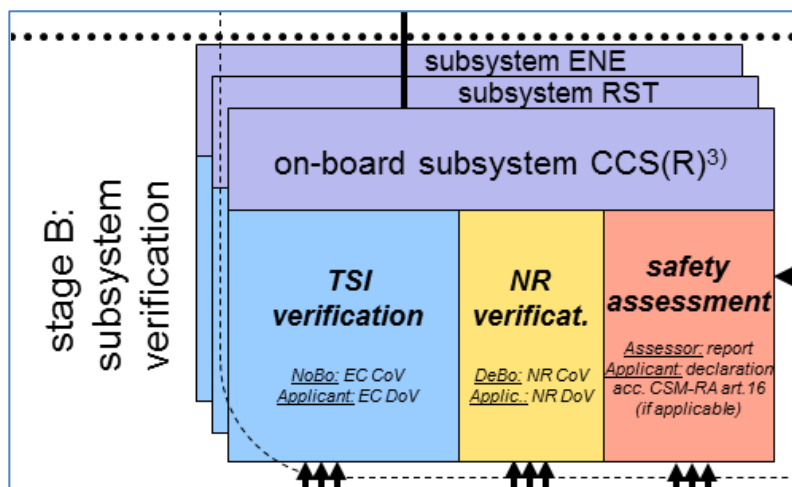


Figure 6: On-board stage B part of process overview

#### 5.2.1. Overview table

	<b>Preconditions</b>	<b>Responsible</b>	
P1	'EC' certificates of conformity (CoC) for all constituents (alternatively for groups of constituents) <sup>31</sup>	NoBos (for ICs)	
P2	'EC' declarations of conformity (DoC)	Applicant	

<sup>30</sup> Chapter 6 is about what to do if new, additional and subsequent authorisations are requested

<sup>31</sup> In case of too many non-conformities, it is up to the NoBo to decide if a certificate can be issued. This decision may be guided by NB-Rail Recommendation for Use RFU-77 ("Certificates with restrictions and conditions for use"); see also Annex III, R8 and R9. The relevant information about non-conformities shall be made available for the assessments of stage B. The NoBo has to take into account the non-conformities of the constituents in the subsystem 'EC' certificate of verification.

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P3	An ETCS infrastructure allowing verification <sup>32</sup> of the on-board CCS subsystem	Applicant <sup>33</sup>	
P4	National Rules (NRs) <sup>34</sup>	Member State	
P5	The on-board CCS subsystem has been configured for a specific vehicle	Manufacturer	
	<b>Tasks to be performed</b>	<b>Responsible</b>	
T1	'EC' verification of the subsystem according to TSI CCS ch. 6.3 with table 6.2 ("what to assess"), the chosen module according to TSI CCS ch. 6.3.2, and Directive 2008/57/EC Annex VI ("verification procedure for subsystems") <sup>35</sup>  The technical file for 'EC' verification (NoBo) shall follow the standard structure given in Directive 2008/57/EC Annex VI ch. 2.4	NoBo (for subsystem)	
T2	Verification of conformity with NRs according to Directive 2008/57/EC Art. 17	DeBo	
T3	Unless other evidence can be provided, TTSV testing shall be used to validate that each network where the vehicle is intended to run can operate with the on-board. If a problem occurs, the analysis according to paragraph 7.4.3 shall take place.	Applicant	
T4	Perform risk assessment <sup>36</sup> according to CENELEC 50126/50128/50129 <sup>37</sup>	Applicant	
T5	In case of significant change: independent assessment according to CSM Regulation 352/2009/EC resp. 402/2013/EU  Note: this assessment includes the integration of the interfaces 1)...5), details see Figure 1	CSM Assessment Body	
T6	Compile the technical file for 'EC' verification of the CCS subsystem according to the contents of Annex I	Applicant	

<sup>32</sup> This infrastructure may be equipped with only a part of all possible functionalities. This infrastructure may be available in lab only. 'EC' verification can mainly be executed in lab.

<sup>33</sup> The applicant has to use the infrastructure provided by infrastructure manufacturer and/or IM or labs

<sup>34</sup> On the management of National Rules, see decision 2011/155/EC and ERA's Application Guide (Part 1 of the Reference Document envisaged by Article 27 of the Railway Interoperability Directive)

<sup>35</sup> This assessment includes checks of vehicle configuration data, or the verification that the checks have been correctly performed (for ETCS baseline 3 see subset-091, v3.2.0, ch. 9.3 "Integrity Requirements for On-board Data Preparation", for ETCS baseline 2 see subset-091 v2.5.0 ch. 9.4)

<sup>36</sup> Including safe integration

<sup>37</sup> This is in line with the application of the CSM Regulation 352/2009/EC resp. 402/2013/EU

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	<b>Documents</b>	<b>Responsible</b>	
D1	<p>'EC' certificate of verification (CoV), indicating any restrictions and conditions of use and including the underlying assessment report</p> <p><i>Note: this 'EC' certificate may be based on 'EC' ISV(s) for parts or stages of the subsystem; in this case the relevant checks need not to be repeated</i></p>	NoBo	
D2	Certificate of NR verification, indicating any restrictions and conditions of use, including the assessment report and the underlying technical documents	DeBo	
D3	TTSV test report	Applicant	
D4	An assessment report regarding the safe integration in relation to the design operating state of the vehicle <sup>38</sup> – based on the risk assessment T4	Applicant	
D5	In case of significant change: the declaration of the proposer as stated in Art. 16 of Regulation 402/2013/EU <sup>39</sup> – based on the safety assessment report of the CSM assessment body	Applicant/Proposer <sup>40</sup>	
D6	<p>'EC' declaration of verification (DoV) according to Directive 2008/57/EC Annex V, indicating any restrictions and conditions of use (see also Annex I, item 5.2) – based on the NoBo's assessment</p> <p>Any restriction and condition of use shall be stated in the declaration in such a way that the details are easy to find for the NSA</p>	Applicant	
D7	<p>Declaration of conformity of the subsystem with National Rules<sup>41</sup>, indicating any restrictions and conditions of use – based on the DeBo's assessment</p> <p>Any restriction and condition of use shall be stated in the declaration in such a way that the details are easy to find for the NSA</p>	Applicant	
D8	The technical file for the CCS on-board subsystem (similar to Annex I)	Applicant	

<sup>38</sup> See ch. 1.2 for definition of safe integration and design operating state

<sup>39</sup> Optional until Regulation 402/2013/EU comes into force

<sup>40</sup> According to the Regulation 402/2013/EU the proposer shall draw the declaration. In the framework of this Guideline the proposer is always the applicant

<sup>41</sup> The NSA WG takes note that not all MSs have notified and published yet their National Rules according to the Directive 2008/57/EC. The existing NRs are also not yet completely analysed and classified (A-B-C)

**5.3. Stage C: APS related checks of the on-board CCS subsystem**

5.3.1. These checks are part of the activities for the APS of the vehicle, see process overview, Figure 7.

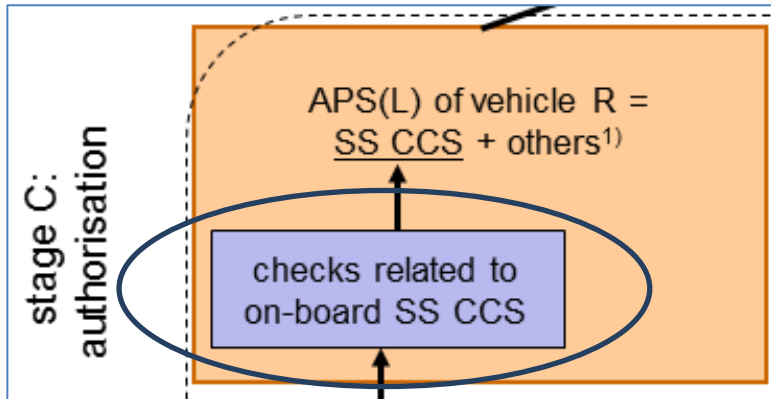


Figure 7: On-board stage C – CCS subsystem part

5.3.2. Overview table

	<b>Preconditions</b>	<b>Responsible</b>	
P1	The deliveries from stage B, i.e. the documents D1...D8.  Note: the additional underlying technical documents of NR verification are not always to be submitted, e.g. because of property rights. They may be requested by the NSA.	Applicant	
	<b>Tasks to be performed</b>	<b>Responsible</b>	
T1	Check of completeness, relevance and consistency of the documents provided by the applicant	NSA	
T2	Information shall be shared <sup>42</sup> on issues that might be relevant for the authorisation process, such as: <ul style="list-style-type: none"> <li>known issues/problems from the subsystem under authorisation or parts of it (accidents, incidents, ...)</li> <li>known issues/problems with the involved bodies (accreditation, safety authorisation, safety certificate, complaints, ...)</li> <li>known issues/problems with the application of the process required by the national legal framework by the involved bodies</li> </ul>	Applicant, NSA	
T3	The NSA shall satisfy itself that the applicant has taken into account these above mentioned issues. In case of justified doubts the NSA may call third party verifications into question and request additional checks from the applicant. <sup>43</sup>	NSA	
T4	The NSA shall check that restrictions and conditions of use are given by the applicant in the technical file	NSA	

<sup>42</sup> See footnote under 4.2.13. about shared information

<sup>43</sup> See ch. 4.2.14. about justified doubts

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	<b>Documents</b>	<b>Responsible</b>	
D1	The on-board CCS subsystem related part of the technical file of the vehicle or vehicle type  The documents to be handed over to the NSA for APS, related to the CCS subsystem, are listed in Annex I.	Applicant	

**5.4. Stage C: APS of the vehicle**

5.4.1. These checks are part of the activities for the APS of the vehicle, see process overview, Figure 8.

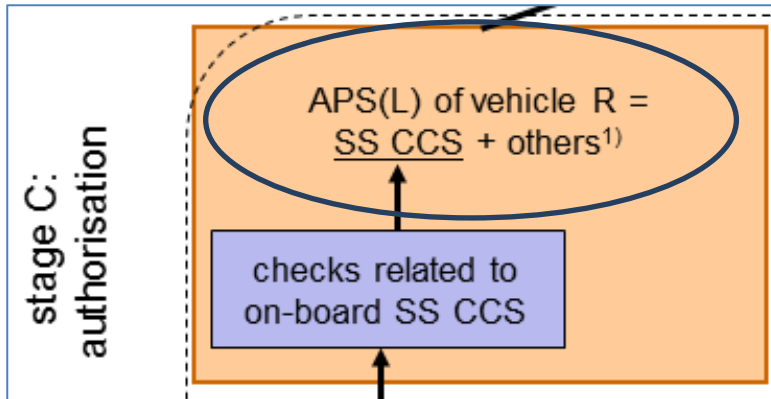


Figure 8: On-board stage C – vehicle

5.4.2. Overview table

	<b>Preconditions</b>	<b>Responsible</b>	
P1	The on-board CCS subsystem related part of the technical file for APS of the vehicle or vehicle type (see D1 in chapter 5.3)	Applicant	
P2	The same file for all other on-board subsystems <sup>44</sup>	Applicant	
P3	Assessment of the fulfilment of all essential requirements at vehicle level <sup>45</sup>	Applicant	
P4	Application for authorisation of the vehicle	Applicant	
	<b>Tasks to be performed</b>	<b>Responsible</b>	
T1	The NSA checks that the process required by the national legal framework has been correctly applied	NSA	
T2	Compile the technical file of the vehicle (including the parts related to the on-board CCS, RST & ENE resp. LOC&PAS subsystems) <sup>46</sup>	Applicant	
T3	Declare that all essential requirements are met and submit the complete technical file including the required declarations	Applicant	
T4	Check of completeness, relevance and consistency of the documents provided by the applicant <sup>47</sup>	NSA	

<sup>44</sup> LOC&PAS for conventional rail, RST and ENE for HS rail

<sup>45</sup> This may be done by providing a safety case according to CENELEC for the vehicle. It is assumed that this assessment can be further reduced as the integration between the subsystems during their 'EC' verification will more and more cover all relevant aspects.

<sup>46</sup> If required by the NLF, the advise of the IM on technical compatibility with the generic network characteristics shall be included

<sup>47</sup> As long as the NLF still requires check of correctness, this check will also be a task of the NSA

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T5	Information shall be shared <sup>48</sup> on issues that might be relevant for the authorisation process, such as: <ul style="list-style-type: none"> <li>• known issues/problems from the subsystem under authorisation or parts of it (accidents, incidents, ...)</li> <li>• known issues/problems with the involved bodies (accreditation, safety authorisation, safety certificate, complaints, ...)</li> <li>• known issues/problems with the application of the process required by the national legal framework by the involved bodies</li> </ul>	Applicant, NSA	
T6	The NSA shall satisfy itself that the applicant has taken into account these above mentioned issues. In case of justified doubts the NSA may call third party verifications into question and request additional checks from the applicant. <sup>49</sup>	NSA	
T7	The NSA shall check that restrictions and conditions of use are given by the applicant in the technical file.	NSA	
T8	Entries in ERATV (European Register of Authorised Types of Vehicles) database <sup>50</sup>	NSA, Applicant	
	<b>Documents</b>	<b>Responsible</b>	
D1	Authorisation for placing in service (APS) of the vehicle (resp. vehicle type/series) <sup>51</sup> for each relevant network <sup>52</sup> , including restrictions and conditions of use (e.g. 1 vehicle only)  Note: APS for a vehicle or for a vehicle type may be time limited <sup>53</sup>	NSA	
D2	Registration in ERATV completed	NSA, Applicant	

<sup>48</sup> See footnote under 4.2.13. about shared information

<sup>49</sup> See ch. 4.2.14. about justified doubts

<sup>50</sup> For vehicle type authorisation, the data for ERATV have to be provided at this stage. Currently, ERATV may be not yet a precondition for registration in the National Vehicle Register (NVR). See also recommendation R27.

<sup>51</sup> ERA remark 06/2012: definition of „vehicle type“ (Directive 2008/57/EC Art. 2w) is still under discussion

<sup>52</sup> The network may include routes equipped with ERTMS, Class B and border crossings (Class B to Class B) commanded by ETCS

<sup>53</sup> There are different reasons for time limitation of type authorisation: 1) to avoid vehicles being built forever according to old legal framework, 2) there are too many non-conformities and time limitation should ensure that these points will be closed



## **6. Principles for new, additional and subsequent authorisations of vehicles**

### **6.1. General issues**

6.1.1. In case new, additional or subsequent authorisations are requested, the following clauses will provide principles how to act. Depending on the requested authorisation, the appropriate elements from chapter 5 are to be applied in order to compile the documents for the authorisation.

6.1.2. Any modification of the CCS system or the installation of a new CCS system or the installation of an additional CCS system shall be evaluated by the applicant in respect to the modified parts. The application for a new or additional APS shall limit to the changes and the impact of the changes to the other parts of the vehicle.

The applicant is also responsible for arranging the necessary TTSV tests and assessments to ensure technical compatibility with existing infrastructure for which the vehicle was already authorised. It is assumed that the infrastructure manager will collaborate to make this possible.

6.1.3. In case of an installation of a new or additional on-board CCS subsystem the process to obtain a new or additional vehicle authorisation shall comply with the Rail Freight Corridor 1 concept (chapter 4). In case of addition of a Class B system the proof of technical compatibility and safe integration follows the relevant national legal framework.

For ERTMS, Directive 2008/57/EC Art. 23 or 25 applies for additional authorisation of the vehicle.

For the ERTMS part, in case of additional authorisation, only issues strictly related to technical compatibility between vehicle and network shall be checked. This is also supported by TTSV testing.

6.1.4. In case of a subsequent authorisation Directive 2008/57/EC Art. 26.3 shall apply. Subsequent APS should be based only on the declaration of conformity to the authorised type.<sup>54</sup>

6.1.5. If a vehicle is intended to operate on different networks (e.g. within Rail Freight Corridor 1), the preferred way to achieve authorisation should be to share between the NSAs the work necessary for all authorisations. One of the NSAs issues the first/new authorisation, and the other NSAs issue additional authorisations. The applicant chooses the NSA for first/new authorisation.

6.1.6. For each NSA, there shall be one dedicated set of documents, including the necessary declarations. They are based on documents for common aspects plus documents for network specific aspects (class B systems, NRs, technical compatibility with the network). The documents for common aspects shall be taken from the first authorisation.<sup>55</sup>

6.1.7. For any further additional/new authorisation, the result of first or additional authorisation shall be treated as equal in respect to the common aspects and will be accepted without further judgement. The NSA will satisfy itself that no new issues are introduced.

### **6.2. Impact of the changes**

6.2.1. New and additional authorisation shall focus on the impact of the change (the “delta approach”).

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<sup>54</sup> This is common practice in many MS, even if it is not clear in the Interoperability Directive.

<sup>55</sup> For the language, the NLF shall be taken into account, see also Annex V

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6.2.2. The following table is an example for the application of the “delta-approach”. For each project, it has to be analysed which interfaces have to be checked (see Figure 1). The NSA may request for evidence.

Examples of integration cases		Interfaces to be checked (see Figure 1)				
Who is responsible?	Applicant	Applicant	Applicant	Applicant	Applicant	
Who will assess?	NoBo	DeBo	NoBo and DeBo	NoBo and DeBo (dependent on NR)	NoBo and DeBo (dependent on NR)	
	Between ICs inside the on-board CCS subsystem	With Class B	With the subsystems of the vehicle	Between on-board and trackside CCS subsystems	Interaction not specific to CCS subsystem	
1	STM (Class B system) integration					
2	CCS subsystem in new vehicle					
3	Additional APS					
4	Additional APS with new TSI					
5	New APS after a new installation of ETCS					
6	New ETCS Software version (e.g. Baseline 3)					
7	Installing an option as part of an existing TSI into a vehicle which was authorised without that option (not used and tested before) <sup>56</sup>					

6.2.3. Technical enhancements are necessary to keep the vehicles up to a technical state of the art. However, if after a change in one subsystem of an existing vehicle, the whole vehicle has to be re-authorised according to new rules (e.g. TSI), technical progress could become economically impossible.

6.2.4. Therefore, the authorised vehicle and all of its subsystems, before the change, shall be considered to meet the essential requirements including safety, even if they have been authorised according to rules not in force anymore.

6.2.5. Only for the new components or functions the new rules shall be applied (i.e. “delta-approach”). Reverse or conflicting effects on existing parts of the system and their documentation shall be taken into account.

6.2.6. In case the change has no impact on the verification or there is no change in the results of the verification (stage B), no new or additional authorisation is required. The related underlying documents will be updated.

6.2.7. When adding ERTMS to a vehicle already authorised, the impact on the other on-board subsystems have to be considered during integration of the on-board CCS subsystem.

<sup>56</sup> Example: Euroloop integration into a vehicle authorised without Euroloop

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- 6.2.8. Consequently, in case of changes to a vehicle already authorised, new or additional authorisation shall be necessary if one of the following documents has changed:<sup>57</sup>
- the content of the declaration of the applicant, that all essential requirements are met
  - the 'EC' declaration of verification
  - the declaration of conformity with National Rules
  - in case of significant change: the declaration of the proposer as stated in Art. 16 of Regulation 402/2013/EU.<sup>58</sup>
- 6.2.9. In case of new or additional authorisation, the impact of all changes since the last authorised state – minor and therefore not subject to authorisation - has to be taken into account.
- 6.2.10. In case of renewed authorisation, the impact of all changes in the legal framework since the last authorised state has to be taken into account.

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<sup>57</sup> *In Italy, the NSA issues authorisation also when there is a "change in vehicle configuration".*

<sup>58</sup> *Optional until Regulation 402/2013/EU comes into force*

## **7. Principles for testing**

### **7.1. TSI requirements related to tests for CCS subsystems**

#### **7.1.1. Operational test scenarios**

Decision 2012/88/EU ch. 6.1.2 defines basic ERTMS testing principles for CCS subsystems. Therefore, each Member State

*“... shall make available to the Commission the operational test scenarios for checking the ERTMS/ETCS and GSM-R part of the Control-Command and Signalling Track-side Subsystem and its interaction with the corresponding part of the Control-Command and Signalling On-board Subsystem.”*

Furthermore, the ERA shall build and publish a database of operational test scenarios, make sure they conform with the specification, and assess if further mandatory test specifications are necessary.

#### **7.1.2. On-board CCS subsystem – recommended part<sup>59</sup>**

Decision 2012/88/EU ch. 6.2.4.1 defines for the use of the operational test scenarios:

*“... to increase confidence that the on-board ERTMS/ETCS can be correctly operated with different track-side applications, it is recommended that the on-board ERTMS/ETCS be tested using scenarios from the data base managed by the Agency... The documentation accompanying the certificate shall indicate the database scenarios against which the interoperability constituent has been checked.”*

#### **7.1.3. On-board CCS subsystem – mandatory part**

Decision 2012/88/EU table 6.2 defines for tests under operational conditions:

*“Test the behaviour of the subsystem under as many different operational conditions as reasonably possible (e.g. gradient, train speed, vibrations, traction power, weather conditions, design of Control-Command and Signalling track-side functionality). The test must be able to verify:*

*1. that odometry functions are correctly performed – basic parameter 4.2.2*

*2. that the on-board Control-Command and Signalling Subsystem is compatible with the rolling stock environment – basic parameter 4.2.16*

*These tests must also be such as to increase confidence that there will be no systematic failures. The scope of these tests excludes tests already carried out at earlier stages: tests performed on the interoperability constituents and tests performed on the subsystem in a simulated environment shall be taken into account.”<sup>60</sup>*

#### **7.1.4. Trackside CCS subsystem – mandatory part**

Decision 2012/88/EU table 6.3 defines for integration with control-command and signalling on-board subsystems and with rolling stock:

*“Reports of tests of the operational scenarios specified in Section 6.1.2 with different certified Control-Command and Signalling On-board Subsystems. The report shall indicate which operational scenarios have been tested, which on-board equipment has been used and whether tests have been performed in laboratories, test routes or real implementation.”*

#### **7.1.5. Reduction of scope of operational tests**

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<sup>59</sup> There is some inconsistency in the TSI: ch. 6.2.4.1 is about ETCS on-board IC, ch. 6.1.2 about on-board SS. This is however alleviated by the fact that the ETCS function of the subsystem can well be proven by lab testing of the ETCS on-board.

<sup>60</sup> See also Annex III, R32

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Decision 2012/88/EU table 6.2 and 6.3 define for both on-board and trackside CCS subsystems:

*“The scope of these tests excludes tests already carried out at earlier stages: tests performed at the level of interoperability constituents and tests performed on the subsystem in a simulated environment shall be taken into account.”*

### 7.2. Overview of the situation

7.2.1. A vehicle can be authorised for a certain network, i.e. a set of routes that use the same functions, engineering rules, requirements and conditions of use, and for which the technical compatibility has been demonstrated.

The meaning of “same functions” in this context is that the functions and parameters are similar in a way that it can be assumed that test results are equivalent. This may be analysed during an “ex ante” study to create e.g. a common test set for the corridor (see ch. 7.4.17), or, more pragmatically, during a vehicle authorisation project (see Annex II, item II-3 d).

Therefore, an extension of the network without additional functions, engineering rules, requirements and conditions of use will not lead to the need of a new authorisation of vehicles already operating on the network.

7.2.2. The aim of the ETCS test specifications subset-076 is to prove the technical interoperability and functionality of the ETCS on-board (IC) against requirements of the SRS (subset-026, system requirements specification).<sup>61</sup> However, this conformity assessment is not intended to validate the technical compatibility between a train equipped with this ETCS on-board and a specific network, because:

- Subset-076 reflects the functions as defined in the SRS, and the flexibility of the ETCS specifications allow different use in the application
- The real behaviour coming from the trackside engineering and operational use of existing/developing implementations<sup>62</sup> has not been taken into account for subset-076
- The number of combinations from telegrams and variables is almost infinite; subset-076 testing can therefore only cover some sensible variants, i.e. not all variants can be checked exhaustively
- Subset-076 does not cover the issues arising from the integration of the ETCS on-board into a specific train

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<sup>61</sup> According to ERA, this scope definition will be changed to “ETCS on-board IC” instead of “on board subsystem” in the next version of subset-076-7

<sup>62</sup> See subset-076-7, ch. 3

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7.2.3. The following diagram illustrates that validation of the on-board subsystem with real trackside can cover only the functional scope of the network(s) used. This is the case even if all subset-026 functions (the whole inner circle) are implemented in the ETCS on-board, which should be the case.

Therefore, it is necessary to indicate the scope of validation in the technical documentation of the vehicle. This scope is indicated by the “functions implemented in the corridor projects” part of the figure.

However, additional tests may only be requested if not yet validated functions are added in a network. In this case, the validity of authorisation will be extended to the new functions (see ch. 7.2.1 and Annex I, 6.1).

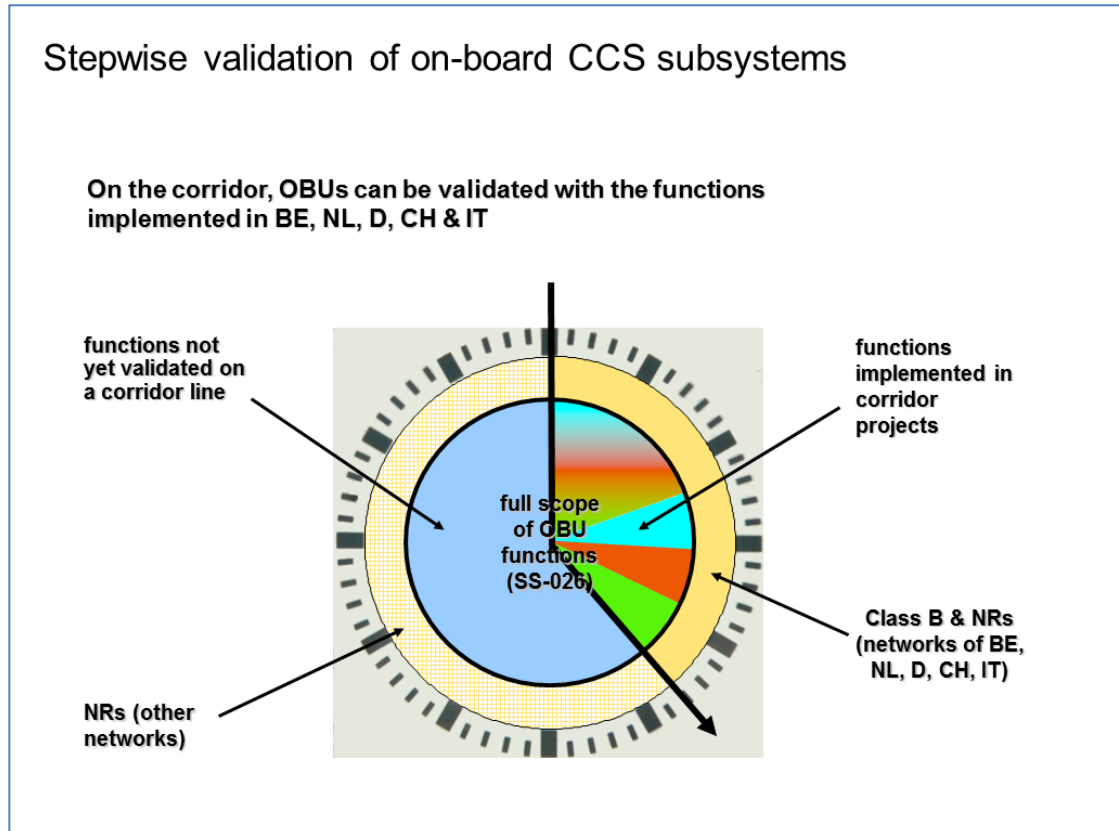


Figure 9: Stepwise validation of on-board CCS subsystems

7.2.4. The stepwise validation approach is for a transitory period only, as long as the functional scope of networks is still growing and new functions need to be validated.

7.2.5. If site tests on the network are necessary, the national legal framework applies.

### 7.3. Types of test

7.3.1. Testing is part of verification and validation to support product development, IC conformity, subsystem integration, subsystem verification, and validation of technical compatibility and safe integration. The following table shows what kind of test can be expected in which stage (see also Figure 5).

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Type of test	To be arranged by	Test reference	Remarks
Product tests	Manufacturer	Proprietary test specification and environment	Before stage A Testing is part of product development No specific Rail Freight Corridor 1 arrangements
IC conformity tests	Manufacturer, NoBo, accredited laboratory	Test specification and environment specific for each IC  For ETCS on-board IC: subset-076, subset-094	Stage A Testing is part of conformity assessment No specific Rail Freight Corridor 1 arrangements
ETCS on-board - vehicle integration tests <sup>63</sup>	Manufacturer, NoBo	a) Lab test bench with vehicle simulator and reference trackside (optional)  b) Real vehicle	Stage B Vehicle parameter specific  Decision 2012/88/EU defines in table 6.2 that ETCS on-board - vehicle integration has to be checked by the NoBo during the 'EC' subsystem verification  No specific Rail Freight Corridor 1 arrangements
RBC-trackside integration tests <sup>64</sup>	Manufacturer, NoBo	a) Lab test bench with RBC, interlocking, and reference ETCS on-board  b) Real trackside	Stage B Track parameter specific  Decision 2012/88/EU defines in table 6.3 that RBC-trackside integration has to be checked by the NoBo during the 'EC' subsystem verification  No specific Rail Freight Corridor 1 arrangements
Track-train system validation (TTSV) tests  a) applied to on-board SS CCS  b) applied to trackside SS CCS	Applicant for APS  a) for vehicle  b) for trackside	Options:  - Lab test bench with RBC, interlocking, Control Center, ETCS on-board  - Remote labs  - Real trackside  - Real vehicle  Operational test cases	Stage B  TTSV tests are means to provide evidence for technical compatibility between the on-board and trackside CCS subsystems <sup>65</sup>  TTSV tests are not meant to check route compatibility of a vehicle. This check is part of the RU's responsibility during operation and shall be possible without any test  Rail Freight Corridor 1 arrangements on TTSV testing are defined and explained in chapter 7.4

#### **7.4. Track-train system validation tests**

7.4.1. The validation of the technical compatibility between the on-board and trackside CCS subsystems shall be supported by track-train system validation (TTSV) testing.

7.4.2. TTSV tests can be applied to on-board CCS subsystems/vehicles as well as to trackside CCS subsystems.

<sup>63</sup> This includes, for example, testing of communication and transitions between STMs and between ETCS and STMs, bus communication and failure diagnosis / revelation / detection, ...

<sup>64</sup> Although this chapter focuses on on-board issues, this test is mentioned here for completeness of the overall process

<sup>65</sup> See chapter 7.4.

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In this Guideline, TTSV tests are mainly considered for the on-board CCS subsystem.<sup>66</sup>

It is assumed that the RBC has been certified before TTSV tests take place.

- 7.4.3. TTSV tests are means for the applicant to provide **evidence for technical compatibility**<sup>67</sup> between on-board and trackside CCS subsystems related to the design operating state<sup>68</sup> of the trackside CCS subsystem and the vehicle and under the functional, technical, environmental and operational conditions where the subsystems will be used.<sup>69</sup>
- 7.4.4. TTSV tests shall be considered as tests of a certified trackside implementation against a certified on-board (as requested in chapter 6 of the TSI). If a problem occurs, the following cases shall be analysed (in the following order):
- 1) the trackside is designed in a way that non specified functions/ performance of the on-board would be necessary. This is an error in trackside design;
  - 2) trackside and on-board are designed with non-compatible assumptions/ interpretations about a function or performance, because of unclear or missing requirements in the TSI. This is a case of TSI deficiency;
  - 3) the functions or performances specified in the TSI do not allow technical compatibility or safe integration. This is a case of error in the TSI;
  - 4) the on-board is not compliant with the TSI (even if erroneously “certified”). This is an error in the on-board design.
- 7.4.5. TTSV tests are a temporary solution to create confidence in the system/products, until a certain level of experience and maturity is reached.
- They shall be reduced as soon as possible, see Annex II.
- After a period of building confidence on the fact that systematic failures or divergent interpretations of the specifications do not cause any more incompatibilities between on-board and trackside, tests for additional authorisations can be reduced to a minimum, focusing on class B transitions and some specific issues<sup>70</sup> in the generic network characteristics.
- 7.4.6. If during tests errors and deficiencies in the European specification are identified, ERA shall be informed according to the Change Control Management (CCM) process.
- To improve the preconditions (specifications, development, testing), it shall be analysed and made transparent to the relevant party what has caused the problems detected during testing (see Annex II, item II-5).
- 7.4.7. As prerequisite of the TTSV testing, full test and certification of on-board and trackside equipment has to be carried out (at least at IC level, with full indication of configuration parameters for the adaptation to the rolling stock) and it has to be

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<sup>66</sup> Note: Such tests are current practise in different projects but under different terms e.g. “IOP tests”, “track-train integration tests (TTI)”, “network access tests”, “system validation tests”, “complementary tests”, “project related system tests”, etc.

<sup>67</sup> Definition of technical compatibility see chapter 1.2

<sup>68</sup> Definition of design operating state see chapter 1.2

<sup>69</sup> “TTSV test” is a term introduced by this Guideline for tests intended to increase confidence that the on-board can correctly be operated with different trackside applications, i.e. to ensure from a practical point of view that systematic failures or divergent interpretations of the specifications do not cause incompatibilities between on-board and trackside

<sup>70</sup> This may include issues related to open points, specific cases, or specific operational scenarios, messages or timing conditions not used in other networks



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ensured that the trackside implementation does not require on-board functions/performance beyond TSI and NR requirements.

In case of product or implementation failure, the issue shall be analysed to identify possible improvements of the certification process.

7.4.8. The operational scenarios of the TTSV shall be made available<sup>71</sup>, with clear indication of performance requirements (e.g., timing), distinguishing what is done by trackside and what answers/reactions are expected by the on-board, including behaviour in degraded conditions (e.g., a message is lost or delayed more than a given time).

7.4.9. The applicant is responsible that the TTSV tests (lab/remote/site) are carried out and possible other means of evidence are provided.

7.4.10. TTSV tests shall be notified as National Rules (NR). Consequently, the DeBo will assess the results of the TTSV tests.

If the tests are published in the network statement, a reference to the network statement has to be a NR.

7.4.11. TTSV tests shall take into account

- Line engineering principles (→ engineering rules of the IM, solutions of the manufacturers)
- Intended use of the route (→ operational scenarios of the IM)
- How the functions are used and implemented (→ solutions of the manufacturers)

TTSV tests shall focus on track specific interface issues, including transitions. In particular, TTSV tests shall cover all relevant operational test scenarios (OTS) of the IM/MS.

TTSV tests have not to be repeated if already done under equivalent conditions (see Annex II, item II-3 d and II-4).

7.4.12. This approach allows the definition of clear actions to take, whenever a problem is detected, and these actions converge to improvement of TSIs and improvement of products. The risk that a new change prejudices the compatibility of the on-board with “old” trackside is kept under control, because parameters are known to all stakeholders (changes are recorded in the certificates of equipment and the requirements of the TSIs).

7.4.13. The end of the TTSV tests for a certain on-board subsystem on Rail Freight Corridor 1 is assumed to be reached when the possible ETCS applications on Rail Freight Corridor 1 (L1 B3, L2 B2/B3, L1LS, etc.) have been successfully tested and authorised.

7.4.14. Laboratory tests as an option for TTSV testing

For Rail Freight Corridor 1 it is recommended that in the framework of TTSV the applicant requests from the manufacturer the implementation of laboratory tests according to the technical principles<sup>72</sup> laid down in “UNISIG Interoperability Test Guidelines” (subset-110), “Interoperability Test Environment Definition” (subset-111) and “UNISIG Basics for Interoperability Test Scenario Specifications” (subset-112).

It is recommended that each ETCS on-board type will be tested in laboratory against the trackside (including engineering data) for each corridor route equipped.

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<sup>71</sup> In Belgium, currently the TTSV test cases are property of the DeBo

<sup>72</sup> Contractual restrictions and non-disclosure principles of subset-110 are not requested by this Guideline. Transparency should be ensured when analysing issues for possible improvements of the mandatory certification process.

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These laboratory tests can result in a written statement of the manufacturer, part of the technical file for authorisation, confirming the completeness and coverage of the testing.<sup>73</sup>

- Manufacturers of trackside equipment provide a statement on the completeness/coverage of the testing with the on-board systems requested by the IM.
- Manufacturers of on-board equipment provide a statement on the completeness/coverage of the testing with the relevant trackside systems.

The test reports and/or the statements shall contain information which tests have been accomplished, which were the findings, the allocation of the findings and how they were closed.

The statement of the manufacturer shall indicate any known error, deviation, restriction and condition of use related to the relevant subsystem.

### 7.4.15. How IMs can support the testing concept of this Guideline

The applicant is fully responsible for arranging all necessary tests and assessments. RU and IM shall give full support to the applicant. The NSA will ask for sufficient evidence of technical compatibility and safe integration, however not prescribe the way to fulfil this task.<sup>74</sup>

Also, the IMs can support the testing concept of this Guideline by implementing in their contracts clauses to ensure that the manufacturers provide the necessary tools and conditions. Therefore it is recommended that the IMs implement in their contracts the measures listed in Annex IV.

### 7.4.16. Database of operational test scenarios

According to Decision 2012/88/EU, ch. 6.1.2., ERA has to create the database of operational test scenarios, based on the operational test scenarios (OTS) to be provided by the Member States.

Operational tests must take into consideration all relevant operational procedures of each network of the corridor in particular in degraded conditions.

### 7.4.17. Network standard and Rail Freight Corridor 1 standard

For APS it would be easier to have one network standard, which is characterised by a common set of functionality and engineering rules.

The aim is: after having passed TTSV for a Rail Freight Corridor 1 test set, a vehicle can run throughout the whole corridor.

IMs are recommended to create for each network a stable set of functions, engineering solutions and operational conditions used on that network (network standard).

Consequently, all network specific TTSV tests of Rail Freight Corridor 1 will develop into a stable set defining the functional and operational characteristics for compatibility with the whole Rail Freight Corridor 1.

It is also recommended that IMs co-operate on harmonisation of operational and engineering rules along the whole corridor.<sup>75</sup>

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<sup>73</sup> These statements may be required by the NLF

<sup>74</sup> Though, in Switzerland IOP testing is required by FOT as a national requirement and the contractor (IM) has to request the IOP for the trackside from the manufacturer, which has to bring the evidence.

<sup>75</sup> NSA WG 03/2013: It is recognised that engineering principles may be implemented in the track geometry and therefore harmonisation of engineering and operational rules is not always possible.

## **8. Considerations on system integration**

### **8.1. Principles to be applied for system integration**

- 8.1.1. It is assumed that the manufacturers have implemented effective development processes according to CENELEC 50126/128/129 for the production stage.
- 8.1.2. Related to development and production of components it is mandatory that all TSI harmonised products fulfil the TSI safety requirements.
- 8.1.3. According to Decision 2012/88/EU, table 6.2 (on-board) and 6.3 (trackside), integration of interfaces is part of the subsystem 'EC' verification. This includes for the CCS on-board subsystem 5 classes of interfaces, (see Figure 1).<sup>76</sup>
- 1) Between ICs inside the on-board CCS subsystem
  - 2) With Class B
  - 3) With the subsystems of the vehicle (RST, ENE...)
  - 4) Between on-board CCS and trackside CCS
  - 5) Interaction not specific to CCS (weight, dynamics, EMC, ...)
- 8.1.4. Related to each particular interface, the applicant shall include in the technical file all restrictions and conditions of use for the integration of the subsystem<sup>77</sup> that may be relevant for the essential requirements.<sup>78</sup>
- 8.1.5. On vehicle level, these five classes of interfaces shall be addressed in the assessment report on safe integration and technical compatibility, see Annex I, 5.5.
- 8.1.6. In general, safe integration includes:
- (a) safe integration between the parts composing a subsystem;
  - (b) safe integration between subsystems that constitute a vehicle or a network project;
  - (c) safe integration of a vehicle with the generic network characteristics;
  - (d) safe integration of a train with the specific routes it operates over;
  - (e) safe integration of vehicles operation, including interfaces between vehicles, and maintenance into the user's SMS;

where:

- points (a),(b), and (c) are part of the authorisation process;
- points (d) and (e) are not part of the authorisation process but all the information needed by a railway undertaking to determine train characteristics and establish train-route compatibility (e.g. conditions of use, values of interface parameters) should be included in the technical file referred to in Article 18 of Directive 2008/57/EC.

#### **8.1.7. Generic product / generic application / generic safety case**

The European Directive only describes vehicle and vehicle type authorisation, similar to specific applications in the CENELEC standards. However, the CENELEC concepts of generic products and generic applications are a useful option to structure

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<sup>76</sup> The operator holding a safety certificate shall respect all TSIs, including OPE. The OPE rules must be taken into account by the operator's SMS, they have no impact on the certification / authorisation of the CCS subsystem.

<sup>77</sup> E.g. current, tension, timers, ...

<sup>78</sup> This principle should ensure that after changes (e.g. addition of Euroloop function) the authorisation effort can be limited to the implications on the affected interfaces.

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the certification work and to avoid repetition. For generic products a generic safety case may be established.

The use of generic products and generic applications is a choice and under the responsibility of the manufacturer. In some Member States an APS or type approval may be granted for them.

The application of this concept is explicitly encouraged, as it can lead to significant reduction of efforts for certification and assessment.

### 8.1.8. Availability

Availability is an open point in Decision 2012/88/EC Annex G; requirements may be notified as national rule, to be checked by the DeBo.

With regard to the authorisation, i.e. to the design operating state, the NSA is not responsible for RAM requirements beyond those originating from National Rules and documents provided by the applicant.

In particular, it is not the responsibility of the NSA to make sure a vehicle can be operated with all restrictions and conditions of use (usability/performance), as long as it is safe and all legal requirements have been fulfilled.<sup>79</sup>

## 8.2. Management of restrictions and conditions of use

8.2.1. As a basic principle, no restriction should be accepted for APS. Authorisation can not always be granted without restrictions and conditions of use, because for example some restrictions and conditions of use are inherited from CoV/DoV or from the safety assessment.

8.2.2. According to Directive 2008/57/EC Art. 21.6, APS “may stipulate conditions of use and other restrictions”.

8.2.3. The restrictions and conditions of use have to be clearly stated in the APS. The information to be prepared by the applicant can be found in Annex I.

8.2.4. The exported restrictions and conditions of use will have to be allocated to someone (operation, maintenance) and will result in operation conditions/limitations and then later in the “right hand side” (see Figure 4) of the process be managed through the SMS of RU and IM and supervised (audited) by NSAs.

8.2.5. The applicant has to bring the restrictions and conditions of use in a transparent way. RUs have to ask for restrictions and conditions of use when buying/leasing a vehicle. This is to be ensured by their SMS. The RU/keeper shall also ensure that all relevant information is communicated to the ECM for him to up-date the maintenance file.

## 8.3. Use of ISV

8.3.1. CoC and DoC can also be issued for one of the parts listed in Decision 2012/88/EU, ch. 2.2 (train protection, radio communication, train detection).

8.3.2. ‘EC’ ISV certificate and ‘EC’ ISV declaration can be issued for "certain parts" (to be defined by the applicant) or "stages" of a subsystem.

8.3.3. In both cases, the certificate and declaration may be issued with restrictions and conditions of use.

8.3.4. However, an APS can not be granted based on an ISV.

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<sup>79</sup> However in extreme cases, i.e. if it is obvious that a vehicle can not be used in practice, the NSA will take measures to prevent its unrestricted authorisation.

## Annex I – Information to be handed over for the vehicle authorisation

This Annex lists CCS related contents that are expected to be included in the set of technical documents handed over by the applicant to the NSA for vehicle authorisation. The content is relevant, not the format or name.

This set of documents is an extract of the documents available in the technical file of the vehicle/subsystem.

### Vehicle [type]:

vehicle		e.g.: electric multi-system locomotive
manufacturer of vehicle		e.g.: Siemens
type approval		<input type="checkbox"/> YES <input type="checkbox"/> NO
serial number(s)	national vehicle numbers	European Vehicle Numbers
4711	1234 5678 90	xxxx xxxx xxx-x
4712	1234 5678 91	xxxx xxxx xxx-x
...		

### The following changes have been made to the ATP-system(s) (ETCS, ATB, PZB, etc.):<sup>80</sup>

No.	ATP-system	Type of change
1.1		<input type="checkbox"/> installation <input type="checkbox"/> upgrade
1.2		<input type="checkbox"/> installation <input type="checkbox"/> upgrade
1.3		<input type="checkbox"/> installation <input type="checkbox"/> upgrade
...	...	...

### TSIs and baselines applicable for this authorisation:

No.	Reference, version, date	Justification
	ETCS and GSM-R baseline	

### The changes led to the following technical characteristics of the vehicle:<sup>81</sup>

No.	Subsystem or component	Manufacturer	HW versions	SW versions
2.1	ERTMS/ETCS on-board system			
2.2	ATP system A			
2.3	ATP system B			
2.4	Display			
2.5	GSM-R voice cab radio			
2.6	Vehicle interface			
2.7	Speed measuring and indicating system			

<sup>80</sup> Only for new authorisation of modified types already authorised

<sup>81</sup> Only for new authorisation of modified types already authorised

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2.8	Driver's safety device			
2.9	Recording system			
	...			

**Type of authorisation:**

3	Type of authorisation  <i>Note: except for first authorisation, refer to previous authorisations</i>	<input type="checkbox"/> first authorisation <input type="checkbox"/> additional authorisation <input type="checkbox"/> renewed authorisation <input type="checkbox"/> subsequent authorisation <input type="checkbox"/> new authorisation (upgrade/renewal)
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**Final provisions:**

4	Restrictions and conditions of use	The regulatory, technical and operational restrictions and conditions of use listed in the Annex are part of this technical file.
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## Attachment of Annex I

**Checklist of reference for the CCS related content of the technical documents handed over by the applicant to the NSA for vehicle authorisation:**

No.	Document	Mandatory information	Notes
5.1	Frame document	<i>Reading guide that references to all documents and their relationships and describes roles and responsibilities</i>	
5.2	Declaration of the applicant that all essential conditions are met		<i>See ch. 4.2.6.</i>
5.3	'EC' declaration of verification (DoV) of the on-board CCS subsystem	'EC' declaration number(s)	<p><i>1) refer to the technical file of the 'EC' verification (see Directive 2008/57/EC Annex V), which is not to be duplicated for APS, but at least</i></p> <ul style="list-style-type: none"> <li><i>• the brief description of the subsystem</i></li> <li><i>• the restrictions and conditions of use (e.g. SRAC)</i></li> </ul> <p><i>shall be provided to the NSA</i></p> <p><i>2) according to Directive 2008/57/EC Annex V.1 the 'EC' declaration of verification has to contain "all the relevant temporary or final provisions to be complied with by the subsystems and in particular, where appropriate, any operating restrictions or</i></p>

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			<p><i>conditions”</i></p> <p><i>3) for vehicle APS have to be provided also ‘EC’ declarations for RST and ENE subsystems</i></p>
5.4	Declaration of conformity of the on-board CCS subsystem with National Rules	number – version – date	<p><i>1) at least the restrictions and conditions of use shall be provided to the NSA</i></p> <p><i>2) for vehicle APS have to be provided also NR verifications for RST and ENE subsystems</i></p>
5.5	assessment report on safe integration and technical compatibility (on vehicle level)	number – version – date	<i>This may be done by providing a safety case according to CENELEC</i>
5.6	In case of significant change: 1) safety assessment report according to CSM Regulation 402/2013/EU 2) Declaration of the proposer as stated in Art. 16 of Regulation 402/2013/EU		<i>Optional until Regulation 402/2013/EU comes into force (21 May 2015)</i>
5.7	Test reports	reports of TTSV tests	<p><i>Test reports shall indicate the trackside configurations used (manufacturer, system version, reference track), and for which network their results are valid.</i></p> <p><i>The test reports should be provided in the technical file. The declaration of verification can mention them.</i></p>
5.8	Requirements on maintenance linked to the design	e.g. product documentation related to maintenance of the subsystem, like key management and requirements on minimum qualification of staff	<i>According to Recommendation 2011/217/EU ch. 5.2, the technical file for APS includes requirements on maintenance linked to the design. The RU shall ensure that the ECM will establish and use an adequate maintenance plan.</i>
5.9	Requirements on operation linked to the design	e.g. product documentation related to operation of the subsystem, like requirements on minimum qualification of staff	<i>According to Recommendation 2011/217/EU ch. 5.2, the technical file for APS includes requirements on operation linked to the design. The RU shall establish and use adequate operational rules.</i>
5.10	Requirements on route suitability		<i>The technical file shall include all parameters needed by RU/IM for checking after the authorisation the compatibility between network and trains</i>

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**Observations, restrictions and conditions of use**

The following information shall be prepared by the applicant in the technical file:

- a) All deviations from conformity
- b) All add-ons that are implemented in the subsystems
- c) All restrictions and conditions of use, with
  - i. the description of their impact
  - ii. the party addressed (operation, maintenance, ...)
  - iii. the assessment whether they have to be coordinated with EC according to Decision 2012/88/EU, chapter 6.4.3.2
- d) All mitigation measures, with the assessment of their applicability and acceptance/acceptability
- e) Any other information relevant for APS

No.	Aspect / condition	Notes
6.1	<p>Technical compatibility</p> <p><b>Condition:</b></p> <p>The subsystem may be operated with ETCS only on routes with the functional and operational conditions tested by the set of test cases / test scenarios specified here</p>	<p>Under this paragraph are indicated the networks<sup>82</sup> for which the subsystem has been validated, based on the functional scope of the track-train system validation tests. It does not cover the route suitability requirements that shall be maintained by the SMS of the RU.</p> <p>Example:</p> <p>“the subsystem has been tested under the functional and operational conditions given by the following set of test cases / test scenarios:</p> <p>validation tests route A, validation tests route B, Netzzugangstests NBS, Netzzugangstests LBL, Prorail RLN 295” (indicate the used test cases / test scenarios)</p>
6.2	<p>safety critical events and observations</p> <p><b>Example for condition:</b></p> <p>installation of a process and report about the installed process to the NSA within 3 months</p>	<p>Any issues based on SRAC of the subsystem shall be mentioned in this table</p> <p>Example for observation:</p> <p>“the safety assessment report requires that a process will be installed to notify safety critical events and observations to the NSA”</p>
<i>Examples for other conditions</i>		
6.x	<p><b>Condition:</b></p> <p>The relevant operational measures have to be communicated to the vehicle holder</p>	<p>Example for observation:</p> <p>“the subsystem does not indicate the speed in mode XY, this requires specific operational measures in mode XY”</p>
6.y	<p><b>Condition:</b></p> <p>The DMI Software has to be upgraded within 12 months</p>	<p>Example for observation:</p> <p>the DMI shows wrong messages in case of XY</p>

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<sup>82</sup> Definition of “network” see chapter 1.2



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6.z	<b>Condition:</b> <i>The system shall be used only on trains &lt;400m</i>	<i>Example for observation:</i> <i>the system does not correctly calculate the braking curves for trains longer than 400m</i>
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## Annex II – Considerations regarding the reduction of testing

- II-1. Today, evidence that all relevant operational situations will work can only be given for the networks respective operational situations tested. This is due to issues related to immaturity, such as:
- a) Not fully validated specifications
  - b) Not fully validated test cases and test environment
  - c) Certificates / subsystems with restrictions and conditions
  - d) Not fully validated track-train integration
  - e) Not fully mature products and product implementation<sup>83</sup>
  - f) Different implementation principles caused by freedom of engineering using ERTMS specs
  - g) Limited experience with (harmonised) transitions from one system/level to the other
- II-2. The applicant for APS of a vehicle has to prove integration of his vehicle with each network where it is intended to run.<sup>84</sup> However, exhaustive field testing shall be only a transitory situation:
- a) The technical development will allow to transfer more and more tests into laboratories.
  - b) With the growth of experience, stability and validation of the specifications and products, the amount of tests for track-train system validation will stepwise be reduced to a minimum.

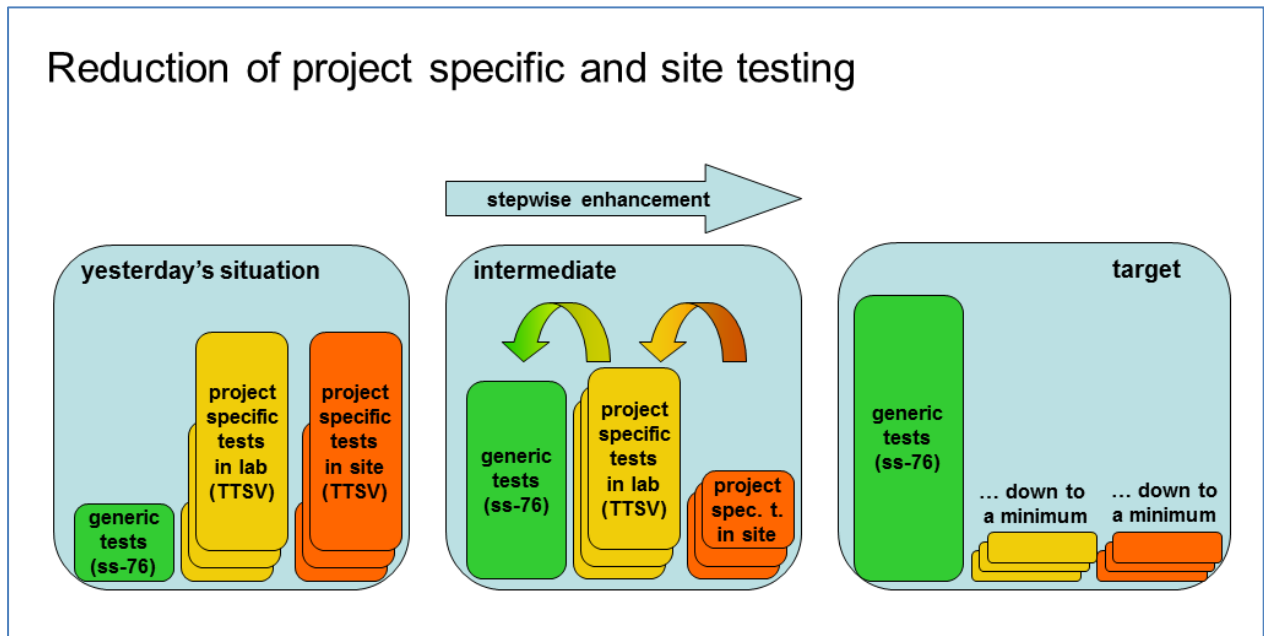


Figure 10: Reduction of project specific and site testing

<sup>83</sup> In fact, during tests in Switzerland only few issues have been found to be solved on specification level, but hundreds of issues to be solved on product level.

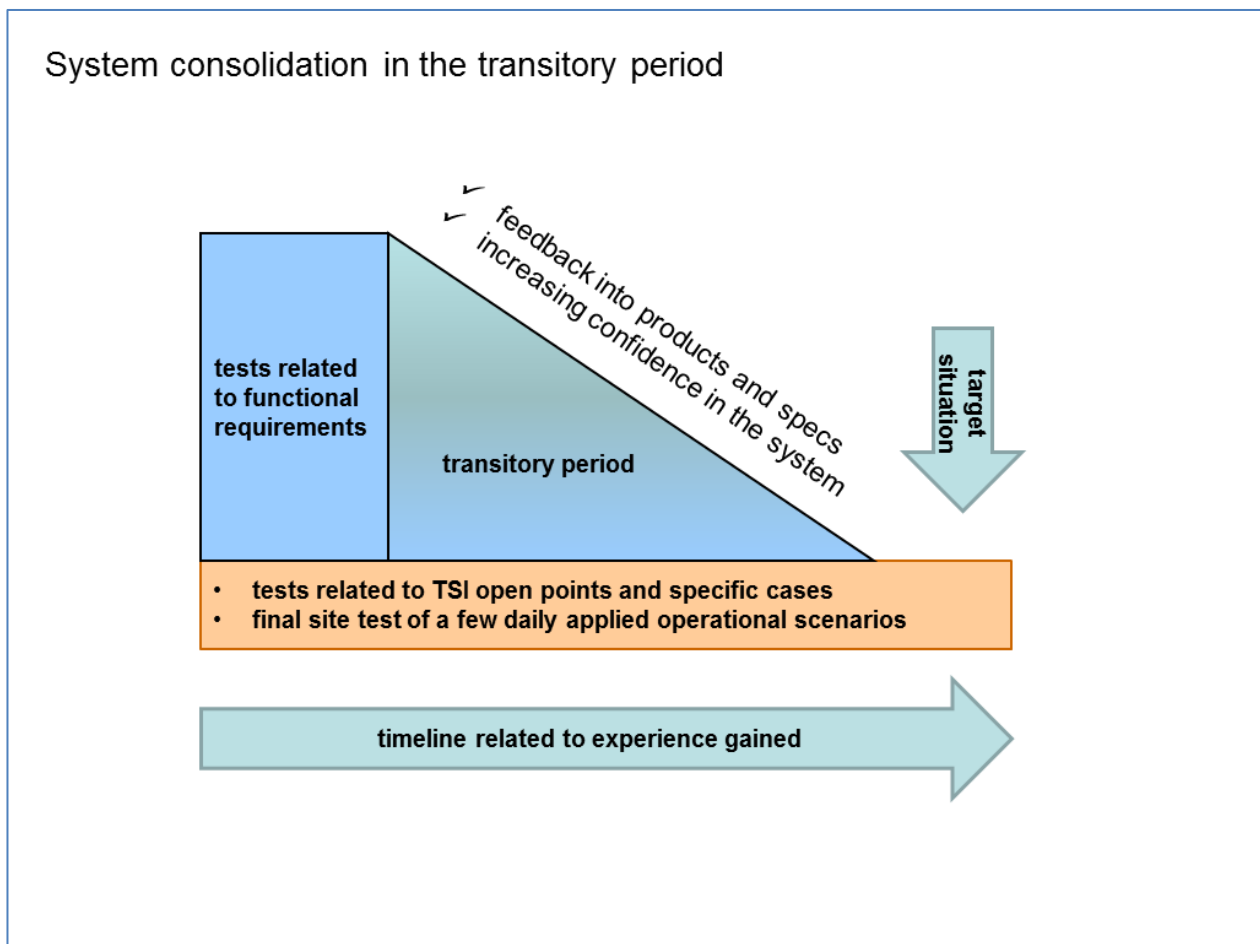
<sup>84</sup> Example Kijfhoek: trains authorised for L1 and L2 routes have to be tested when L1 and L2 routes will be integrated to ensure they can do the L1-L2 transition. See Annex I, item 6.1.

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- II-3. The applicant has several possibilities to demonstrate that tests have become no longer necessary. Some options are given here for information. However, it is not the task of the NSA to prescribe which options are to be used:
- The TTSV test applied to an on-board SS CCS is proven to be fully covered by mandatory conformity tests (subset-076).
  - Lab tests can be taken into account if they have been performed in a way that ensures the same system behaviour in field.
  - TTSV field tests can re-use the manufacturer's field tests during their ETCS on-board - vehicle (or RBC - trackside) integration tests, if those cover the TTSV test cases.
  - TTSV tests of a vehicle related to a specific route or network can be reduced by those tests successfully passed on other routes or networks if the conditions of the other routes or networks (engineering rules, operational scenarios) ensure the same system behaviour (equivalent test conditions).<sup>85</sup>
- II-4. The full scope of TTSV tests will be tested only in the first projects. In the target situation, only conformity tests and a small set of final route or network specific tests will be necessary to re-authorise a vehicle for a network.<sup>86</sup>

TTSV testing will finally be reduced to a few site tests for verification of TSI open points and some daily applied operational scenarios, see Figure 11.



<sup>85</sup> See recommendations R22, R23 and R36 to facilitate this

<sup>86</sup> See chapter 7.4.13-7.4.14

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*Figure 11: Reduction of TTSV testing in the transitory period*

- II-5. In the transitory period, processes should be installed to consolidate the experience gained during TTSV testing with the aim to reach a stable target situation in a few years. These processes should include:
- a) Feedback on product related issues into the products (e.g. software maintenance)
  - b) Feedback on specification issues into the system specifications (e.g. subset-026, Change Request process)
  - c) Feedback on missing test conditions into the mandatory test specifications (subset-076, ...)
  - d) Feedback on operational conditions and operational rules into the operational test scenario database and into national operational rules
  - e) Feedback on line engineering solutions into the IM's engineering rules and into European engineering guidelines
  - f) Feedback on missing National Rules into the reference documents database
  - g) Feedback on issues regarding the certification and authorisation process into European and national legal framework or into harmonised standards and guidelines

The end of this process is reached when all products are fully compliant and interoperable, and no new issues will be detected during TTSV testing. The more efficient the feedback process is organised, the earlier this goal will be achieved.

II-6. Note:

According to Directive 2008/57/EC Art. 16, line specific tests may always be required by Member States except the applicant can provide sufficient evidence that the subsystem has already been verified with identical requirements (= test cases) under identical operational conditions (= line engineering & operational rules).<sup>87</sup>

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<sup>87</sup> This is the understanding of the WG of what is not clear in Directive 2008/57/EC

## **Annex III – List of recommendations**

In order to streamline the application of the European legal framework and to enhance the procedural harmonisation, this Annex lists recommendations, related to the authorisation process, that have been identified during the work on the Guideline, but could not (yet) be solved in the frame of the NSA working group.

<b>No.</b>	<b>Description</b>
R1	<p>It is recommended to develop a harmonised NoBo assessment checklist for constituents (stage A) and subsystem (stage B).</p> <p>Such checklist</p> <ul style="list-style-type: none"> <li>- would create common quality standards for certification</li> <li>- would allow one assessment body to understand what has been checked by another, and what not</li> <li>- would therefore enhance mutual recognition</li> <li>- would in particular enhance ISV and generic certifications</li> <li>- would help to understand and trace the reason for restrictions and conditions of use</li> </ul>
R2	<p>It is recommended to specify mandatory content and format for ‘EC’ certificate of conformity and ‘EC’ declaration of conformity for an IC or group of ICs.</p> <p>Currently, the use of the common format for DoC published on the ERADIS website is not mandatory. Furthermore, ERA should maintain the template in a controlled way.</p>
R3	<p>It is recommended to specify mandatory content and format for ‘EC’ certificates of verification and ‘EC’ declarations of verification for a subsystem.</p> <p>Currently, the use of the common format for DoV published on the ERADIS website is not mandatory. Furthermore, ERA should maintain the template in a controlled way.</p>
R4	<p>It is recommended to specify common format for certificates of NR verification and declarations of NR verification.<sup>88</sup></p> <p>The NSA WG recommends to use such common format to streamline the authorisation process.</p>
R5	<p>It is recommended to specify common formats for applications and APS.</p>
R6	<p>It is recommended to require that in case of known errors, deviations, restrictions and conditions of use of ICs, all those issues have to be indicated in the DoC, together with a description of their potential impact. This shall include also add-ons that have been implemented.</p> <p>As the description of the potential impact may be very complicated, this may also be in the technical file accompanying the declaration.</p>

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<sup>88</sup> See definition of NR in chapter 1.2

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No.	Description
R7	<p>It is recommended to harmonise the representation of restrictions and conditions of use in the declarations and technical files.</p> <p>The APS document should contain explicit references in which document non-conformities and conditions are found. The aim is to avoid duplication of this information in the APS document.</p> <p>Any restriction and condition of use shall be stated in the declaration in such a way that the details are easy to find for the NSA, the APS document will refer to it. If too complex, information may be in the technical file but explicit reference has to be given.</p>
R8	<p>It is recommended to have a legal framework with criteria in which case (and why) non-conformities of ICs and subsystems can be accepted (certificate can be issued) or not.</p> <p>RFU-77 is an attempt to solve this issue.</p> <p>Consequently, it should be clarified if a subsystem can receive 'EC' verification when one or more constituents have no 'EC' certificate of conformity.</p>
R9	<p>It is recommended to solve the following issue:</p> <p>Can a subsystem be certified / a vehicle be authorised if a CoC/DoC is not available for all ICs? (see also R6-R8)</p> <p>Remark: according to the Guideline, the non-conformities of the constituents have to be taken into account in the subsystem certificate.</p>
R10	<p>It is recommended to develop criteria when there are too many restrictions and conditions of use to continue the authorisation process.</p>
R11	<p>It is recommended to clarify which limitations (functions, interfaces) are possible for on-boards (e.g. only L1), and if necessary to analyse what has to be done to enforce complete on-boards.</p>
R12	<p>It is recommended to clarify the recognition/accreditation criteria and the assessment scope for the different assessment bodies DeBo and CSM AsBo.</p> <p>For the DeBo and the CSM AsBo the coverage and consequently the required competences for recognition/accreditation are still unclear. Therefore a common definition is urgently required.</p> <p>Assuming that NoBo and DeBo are intended to do their assessments based on rules without any judgement, it seems to be different for the CSM AsBo. Without further clarification it is almost impossible to achieve recognition/ accreditation and harmonisation/mutual acceptance for these tasks.</p>

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No.	Description
R13	<p>It is recommended to provide a more detailed description for the assessment of technical compatibility and safe integration. This should include a clarification if the scope of safe integration in Directive 2008/57/EC is the same as in Regulation 402/2013/EU.</p> <p>No common understanding for the assessment of technical compatibility and safe integration is used today by the assessment bodies.</p> <p>It should be clarified which activities for technical compatibility and safe integration are related to the design operating state and which are related to operation and maintenance.</p> <p>Check of the safe integration is stated as a Member State task with reference to the APS in the Directive 2008/57/EC and as a CSM assessment body task with reference to significant changes in Regulation 352/2009/EC resp. 402/2013/EU.<sup>89</sup></p>
R14	<p>It is recommended to specify common criteria for completeness and consistency of the documents handed over by the applicant to the NSA for vehicle authorisation.</p> <p><i>Note 1: As a first step, NSA WG created a list indicating a possible structure of documents for APS (see Annex I)</i></p> <p><i>Note 2: The NSA WG also gives some guidance on the contents which should be further developed (see Annex I).</i></p> <p><i>Note 3: The NLF Application Guide refers to a check for completeness “as per the agreed scope”, i.e. the scope has to be specified in the pre-engagement file</i></p>
R15	<p>It is recommended to give more guidance on the use of the terms major from the Directive 2008/57/EC and significant change from the Regulation 352/2009/EC resp. 402/2013/EU.</p> <p>They are stated as decision questions with reference to changes on the railway system (here the CCS subsystem). A harmonised approach to the decision if a change related to CCS is significant or not can avoid ambiguity on the need of a CSM AsBo.</p>
R16	<p>It is recommended to define the template that the applicant compiles to give evidence that a change is not significant according to Regulation 402/2013/EU.</p> <p>In an interoperability scenario among many MS/NSAs, it would be better to define a template of the "written statement" to share the main information that it has to contain.</p>
R17	<p>It is recommended to give more guidance (e.g. in DV29bis) for the possibility to run on the network for tests or for other purposes before APS is granted.</p> <p>Other purposes may be: using a non authorised vehicle for training purposes in the same time as applying for its proper APS for that network, or a non authorised vehicle has to be moved from one location to another for maintenance or building purposes.</p>

<sup>89</sup> There may be some clarifications in the follow-up of Recommendation 217/2011/EC (known as DV29bis)

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No.	Description
R18	<p>It is recommended to harmonise definition and use of the terms and abbreviations for national rules, notified national rules, national technical rules, notified national technical rules, national safety rules etc.</p> <p>It should also be clarified by which and whose activity a rule becomes a notified rule and whether a rule that is refused by EC is still a (notified) (national) rule.</p>
R19	<p>The content of some National Rules is not owned by the MS but e.g. by a manufacturer (example: solutions related to Class B systems). The rule may not be published<sup>90</sup>, but made available for assessment. Therefore, only a reference to that rule can be notified.</p> <p>It is recommended to solve this issue.</p>
R20	<p>It is recommended clearly to allocate the ERTMS system requirements to on-board/trackside.</p> <p>Currently, the ERTMS requirements are not yet clearly allocated to on-board/trackside. This is an obstacle for harmonised certification and assessment.</p>
R21	<p>It is recommended to deliver the ETCS on-board from the beginning with all mandatory ETCS functions implemented and certified by subset-076 tests.</p>
R22	<p>It is recommended that the TTSV test scenarios of the different networks on the corridor will be analysed to identify which tests in one network cover tests in other networks on the corridor.</p> <p>This will support mutual acceptance of test results and reduce the number of tests to be done for subsystem verification. See also R36 to support that.</p>
R23	<p>To support the mutual acceptance of test results, TTSV tests shall use a harmonised format for test reporting.</p> <p>Furthermore, the test results shall be included in a standardised observable database. It is recommended to develop these tools in the railway sector.</p>
R24	<p>It is recommended to provide a legal definition of “design operating state” with relation to subsystems and vehicles.</p> <p>The term is used in Directive 2008/57/EC Art. 2(q) and Recommendation 2011/217/EU without legal definition.</p>

<sup>90</sup> *E.g. due to copyright law*



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No.	Description
R25	<p>It is recommended to provide a legal definition of</p> <ul style="list-style-type: none"> <li>• Technical compatibility</li> <li>• Safe integration</li> </ul> <p>These terms are used in Directive 2008/57/EC and Recommendation 2011/217/EU without legal definition, which leads to different interpretations.</p> <p>It is also recommended to clarify the relationship between safe integration (of a subsystem, of a vehicle) and the fulfilment of the essential requirement safety (for a subsystem, for a vehicle).</p>
R26	<p>It is recommended to use common principles for the use of languages in technical files on Rail Freight Corridor 1.</p> <p>A proposal can be found in Annex V.</p>
R27	<p>It is recommended to give more guidance for a common approach on the use of vehicle types, subsequent authorisation, registration in ERATV (European Register of Authorised Types of Vehicles) / NVR (National Vehicle Register) and related time limitations.</p> <p>Some MS do not authorise vehicles but only register them according to authorised type. They require design change of all vehicles registered under this type if the type design changes.</p> <p>Some MS authorise each vehicle and require no change to authorised vehicles if the original type design changes.</p> <p>There is also no common approach on the time limitation for vehicle and type APS.</p>
R28	<p>It is recommended to develop harmonised safety targets on European level.</p> <p>This would be a major contribution to the mutual acceptance of safety assessments.</p>
R29	<p>It is recommended to demand that additional requirements like DC (designer choice) change requests (not only missing requirements) shall be mentioned in certificates.</p>
R30	<p>It is recommended to set up a process how to share information between NSAs which is important for authorisation.</p>
R31	<p>It is recommended to create a European Hazard Log, where all ETCS related (according to system definition subset-091) safety relevant observations of the stakeholders will be collected, classified and tracked until closed.</p> <p>As a starting point, the observations collected in subset-113 could be taken on board.</p> <p>There should be an obligation of the IMs, RUs and manufacturers to report their ETCS related safety relevant observations to their NSA/MS and the NSA/MS should report to this European database.</p>

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<b>No.</b>	<b>Description</b>
R32	<p>It is recommended to clarify table 6.2 of Decision 2012/88/EU, last item.</p> <p>The wording may lead to the misunderstanding that tests under operational conditions are limited to the two explicitly specified aspects. The meaning is: "These tests must be able to verify <i>at least</i>."</p> <p>It is also recommended to number the items in the tables for better reference.</p>
R33	<p>It is recommended to clarify the following question:</p> <p>Will certificates lose their validity if the mandatory process (e.g. the test specifications) was changed?</p> <p>Such changes may become necessary if deficiencies in the mandatory documents (e.g. subset-076) will be detected.</p>
R34	<p>It is recommended to include the contents of Annex I in the template for technical file which is being developed by ERA (Task Force Templates).</p>
R35	<p>It is recommended that technical solutions agreed in the sector will be published as soon as they are available in a way that it gives certainty for contracts and projects.</p>
R36	<p>It is recommended to develop criteria to be able to determine which tests are equivalent.</p> <p>This will enhance the possibility to prove that tests need not to be repeated (see ch. 7.2.1. and Annex II item II-3 d)</p>

## **Annex IV – Possible measures of IMs to support the testing approach of this Guideline**

The test and authorisation process for sections of Rail Freight Corridor 1 should be organised in a way that the authorisation of vehicles for operation on Rail Freight Corridor 1 will be facilitated.

It is therefore recommended that the IMs include in their contracts the following provisions to be fulfilled by the manufacturer of the trackside ETCS equipment:

1.	Technical information	The manufacturer has to provide the track description, engineering data and track-train system validation test cases for the implementation of the contracted trackside ETCS equipment in accordance to a common standard, based on subset-112.
2.	Test cases	The manufacturer has to provide all test cases that are required to prove safe and interoperable operation under the specific conditions of this ETCS infrastructure system. The test cases shall meet the specified operational conditions in combination with on-board CCS subsystems certified to comply with the European standard.
3.	Operational test scenarios	For this purpose, the infrastructure manager will provide a set of operational test scenarios in European standardised format, that cover the operation of ETCS on the Corridor. The manufacturer has to demonstrate that these operational test scenarios are fully covered by his tests. Any deviation has to be agreed with the infrastructure manager.
4.	Lab test interfaces	The manufacturer has to use a laboratory test environment according to the technical principles of UNISIG subset-110/-111/-112.
5.	TTSV test with different ETCS on-boards	On request of the infrastructure manager, the manufacturer <sup>91</sup> has to perform track-train system validation tests with on-board units of different suppliers before the trackside subsystem will be accepted. <sup>92</sup>
6.	Lab test environment	The laboratory tests shall be performed using the above mentioned track description and engineering data together with, for level 2 sections, the real RBC hardware and software version.
7.	Lab access for on-board applicants	For the purpose of authorisation of rolling stock the trackside manufacturer <sup>93</sup> has to provide the laboratory test environment including technical support for tests with ETCS on-boards of applicants that apply for authorisation on the corridor.
8.	Technical support for RUs	If necessary, the manufacturer has to cooperate in field tests and test result analysis that have to be performed with ETCS vehicles of railway undertakings for their authorisation on the Corridor.

<sup>91</sup> Alternatively, the tests could also be managed by the IM himself.

<sup>92</sup> Some IMs require at least 3 different on-board subsystems

<sup>93</sup> Alternatively, the test environment could also be owned/managed by the IM himself.

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9.	Cross tests	Before placing in operation the trackside equipment, on request of the infrastructure manager, the manufacturer has to support cross field tests with vehicles equipped with ETCS on-boards of different suppliers.
10.	Information exchange	All IMs of Rail Freight Corridor 1 should set up an information platform where they can share information on their test cases and test results.

## **Annex V – Recommendations on the use of languages**

- V-1. The use of different languages is a barrier for cross acceptance and mutual recognition. However, this issue is not yet solved even on EC level, because the national legal framework prescribes the language to be used.
- V-2. The use of translations is hampered by the following facts:
  - a) Risk to introduce mistakes and ambiguities
  - b) Lack of technically qualified translators
  - c) Cost and cost allocation
  - d) Misunderstandings due to individual use of English
  - e) Lack of legal value
- V-3. It is therefore recommended to exchange documents as far as possible in their original language.<sup>94</sup>
- V-4. It is recommended to all stakeholders, especially at technical level, to write their original documents in English, as much as possible and conformable to national law.

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<sup>94</sup> *In Italy, the applicant has to deliver all documents of the technical file in Italian language (D.Lgs. 10-8-2007 n. 162, related to 2004/49/CE and 2004/51/CE, article 9)*

## Annex VI – Certification of ICs

### Stage A: Conformity assessment of interoperability constituents (on-board and trackside)

This stage is out of scope of this Guideline. It is given here for information to put the vehicle authorisation in a wider context. No specific arrangements for this stage are given in this Guideline.

No.	Preconditions	Responsible	
P1	TSI to be applied is available and can be applied appropriately, including valid version of test specification (e.g. subset-076 for ETCS on-board)	ERA	
P2	Test lab for the ETCS on-board IC is accredited to perform subset-076 tests	Accreditation body	
P3	Products are available that implement TSI requirements	Manufacturer	
	<b>Tasks to be performed</b>		
T1	All relevant conformity tests and verifications applicable to the constituent or group thereof <sup>95</sup>	Applicant	
T2	Assessment of conformity according to Decision 2012/88/EU ch. 6.2 (table 6.1) and the selected module according to ch. 6.2.2	NoBo	
	<b>Documents</b>		
D1	'EC' certificates of conformity (CoC) of interoperability constituents (IC, or groups of IC) in the on-board/trackside CCS subsystem according to Decision 2012/88/EU ch. 5	NoBo	
D2	'EC' declarations of conformity (DoC) according to Annex IV of Directive 2008/57/EC  Note: According to the European process, 'EC' declaration of conformity shall be made without conditions and limitations contradicting/conflicting with mandatory requirements <sup>96</sup>	Manufacturer	

<sup>95</sup> For ETCS on-board IC: conformity tests using the test cases of subset-076 in an accredited test lab

<sup>96</sup> However, real life certificates are still "full of non-conformities", because of the immaturity of the standard and of the products.

## Annex VII – Authorisation of trackside subsystems

### Stage B: ‘EC’ verification of the trackside CCS subsystem

	<b>Preconditions</b>	<b>Responsible</b>	
P1	‘EC’ certificates of conformity (CoC) for all constituents	NoBos (for ICs)	
P2	‘EC’ declarations of conformity (DoC)	Applicant	
P3	An ETCS vehicle allowing verification <sup>97</sup> of the trackside CCS subsystem	Applicant	
P4	Engineering rules and operational guide <sup>98</sup> for the relevant trackside	Applicant	
P5	The trackside CCS subsystem has been configured for this specific project	Applicant	
P6	National verification of components not underlying TSI rules (Class B systems, cables, ...) and safety assessment of these parts <sup>99</sup>	Applicant	
	<b>Tasks to be performed</b>	<b>Responsible</b>	
T1	‘EC’ verification of the subsystem according to TSI CCS ch. 6.3 with table 6.3 (“what to assess”), the chosen module according to TSI CCS ch. 6.3.2, and Directive 2008/57/EC Annex VI (“verification procedure for subsystems”) <sup>100</sup>	NoBo (for subsystem)	
T2	If National Rules (NR) for trackside exist, verification of conformity with NRs according to Directive 2008/57/EC art. 17 <sup>101</sup>	DeBo	
T3	Unless other evidence can be provided, TTSV testing can be used to validate that the trackside can operate with certified CCS on-boards. If a problem occurs, the analysis according to paragraph 7.4.4 shall take place. <sup>102</sup>	Applicant	
T4	Perform risk assessment according to CENELEC 50126/50128/50129 <sup>103</sup>	Applicant	
T5	In case of significant change: independent assessment according to CSM Regulation 352/2009/EC resp. 402/2013/EU	CSM Assessment Body	
T6	Compile the technical file for ‘EC’ verification of the CCS subsystem	Applicant	
	<b>Documents</b>	<b>Responsible</b>	

<sup>97</sup> This on-board may be available in lab only. ‘EC’ verification can mainly be executed in lab.

<sup>98</sup> The network operator should have a document which explains the operational rules under ETCS. E.g. at L1 the distance a vehicle have to stop in front of a signal without getting an influence from the first balise

<sup>99</sup> Usually following the relevant CENELEC standards

<sup>100</sup> This assessment includes the check of configuration data (line engineering) (see TSI table 6.3, aspect 5), or the verification that the checks have been correctly performed (for ETCS baseline 3 see subset-091, v3.2.0, ch. 9.2 “Integrity Requirements for Trackside Data Preparation”, for baseline 2 see ss-91 v2.5.0 ch. 9.2 and 9.3)

<sup>101</sup> On the management of National Rules, see decision 2011/155/EC and ERA’s Application Guide (Part 1 of the Reference Document envisaged by Article 27 of the Railway Interoperability Directive)

<sup>102</sup> The applicant is responsible to arrange the necessary TTSV tests and assessments to ensure technical compatibility with existing vehicles authorised on its infrastructure.

<sup>103</sup> This is in line with the application of the CSM Regulation 352/2009/EC resp. 402/2013/EU

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D1	<p>'EC' certificate of verification (CoV), indicating any restrictions and conditions of use and including the underlying assessment report</p> <p>Note: this 'EC' certificate may be based on 'EC' ISV(s) for parts or stages of the subsystem; in this case the relevant checks need not to be repeated</p>	NoBo	
D2	<p>If applicable, a certificate of NR verification, indicating any restrictions and conditions of use and including the underlying assessment report</p>	DeBo	
D3	<p>'EC' declaration of verification (DoV) according to Directive 2008/57/EC Annex V</p> <p>Any restriction and condition of use shall be stated in the declaration in such a way that the details are easy to find for the NSA</p>	Applicant	
D4	<p>If applicable, a declaration of conformity of the subsystem with National Rules – based on the DeBo's assessment</p> <p>Any restriction and condition of use shall be stated in the declaration in such a way that the details are easy to find for the NSA</p>	Applicant	
D5	<p>An assessment report regarding the safe integration in relation to the design operating state of the CCS subsystem – based on the risk assessment T4</p>	Applicant	
D6	<p>In case of significant change: the declaration of the proposer as stated in Art. 16 of Regulation 402/2013/EU<sup>104</sup> – based on the safety assessment report of the CSM assessment body</p>	Applicant/Proposer	
D7	<p>The technical file for the CCS trackside subsystem</p>	Applicant	

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<sup>104</sup> *Optional until Regulation 402/2013/EU comes into force*



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**Stage C: APS of the trackside CCS subsystem**

	<b>Preconditions</b>	<b>Responsible</b>	
P1	The deliveries from stage B, i.e. the documents D1...D7.	Applicant	
P2	The trackside CCS subsystem has been integrated in a specific route	Applicant	
P3	Application for authorisation of the trackside CCS subsystem	Applicant	
	<b>Tasks to be performed</b>	<b>Responsible</b>	
T1	Compile the technical file for APS	Applicant	
T2	Declare that all essential requirements are met and submit the complete technical file including the required declarations	Applicant	
T3	Check of completeness, relevance and consistency of the documents provided by the applicant	NSA	
T4	The NSA checks if the process required by the national legal framework has been correctly applied	NSA	
T5	Information shall be shared <sup>105</sup> on issues that might be relevant for the authorisation process, such as: <ul style="list-style-type: none"> <li>• known issues/problems from the subsystem under authorisation or parts of it (accidents, incidents, ...)</li> <li>• known issues/problems with the involved bodies (accreditation, safety authorisation, safety certificate, complaints, ...)</li> </ul> known issues/problems with the application of the process required by the national legal framework by the involved bodies	Applicant, NSA	
T6	The NSA shall satisfy itself that the applicant has taken into account these above mentioned issues	NSA	
T7	The NSA shall verify that restrictions and conditions of use are given by the applicant in the technical file	NSA	
	<b>Documents</b>	<b>Responsible</b>	
D1	Authorisation for placing in service (APS) of the trackside CCS subsystem, including restrictions and conditions of use	NSA	

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<sup>105</sup> See footnote under 4.2.13

## Annex VIII – Operation

This stage is out of scope of this Guideline. It is given here mainly to make clear what is not part of authorisation.

### Stage D: Operation

- a) Network access criteria are to be used by the operator to check the compatibility with a route to be operated (max axle load, systems installed, etc.).
- b) The process steps after APS (ascertaining route compatibility, as described in Recommendation 2011/217/EU, ch. 6.2) are not in the scope of this Guideline.
- c) However, to support this, it is necessary to make available to the RU the restrictions and conditions of use which have been considered within the construction and authorisation of the vehicle and which have to be checked by the RU before operation.
- d) The correct use of this information and of the information taken from the RINF is to be ensured by the SMS of the RU. As long as RINF is not yet available, network statements or other type of supporting documentation shall be used.

No.	Preconditions	Responsible	
P1	APS for the relevant network, including technical file containing the parameters to be checked before operation	NSA	
P2	Track characteristics (basic parameters: track gauge, electrification, axle load, ETCS level ...) of the relevant routes	IM	
P3	Vehicle types are registered in ERATV (European Register of Authorised Types of Vehicles)	Applicant, NSA	
	<b>Tasks to be performed</b>	<b>Responsible</b>	
T1	Register individual vehicles in NVR (National Vehicle Register) <sup>106</sup>	Keeper	
T2	Check technical compatibility of the authorised vehicle with the basic parameters of the routes to be operated as stated in RINF and network statement <sup>107</sup> (see Figure 12)	RU	
T3	The SMS of the RU has to ensure that the vehicle is operated only on routes that belong to the network for which the APS was granted	RU	
T4	Confirm/support <sup>108</sup>	IM	
	<b>Documents</b>	<b>Responsible</b>	
D1	Conclusion inside the RU that the train can be operated on the envisaged routes	RU	
D2	Registration in NVR completed	Keeper/RU	

<sup>106</sup>Not a precondition for authorisation, however some Corridor MSs require registration as a precondition

<sup>107</sup>No tests shall be needed after APS, see ch. 4.2.11

<sup>108</sup>ERA comment 23/07/2012: This issue will be covered further in the DV29 update

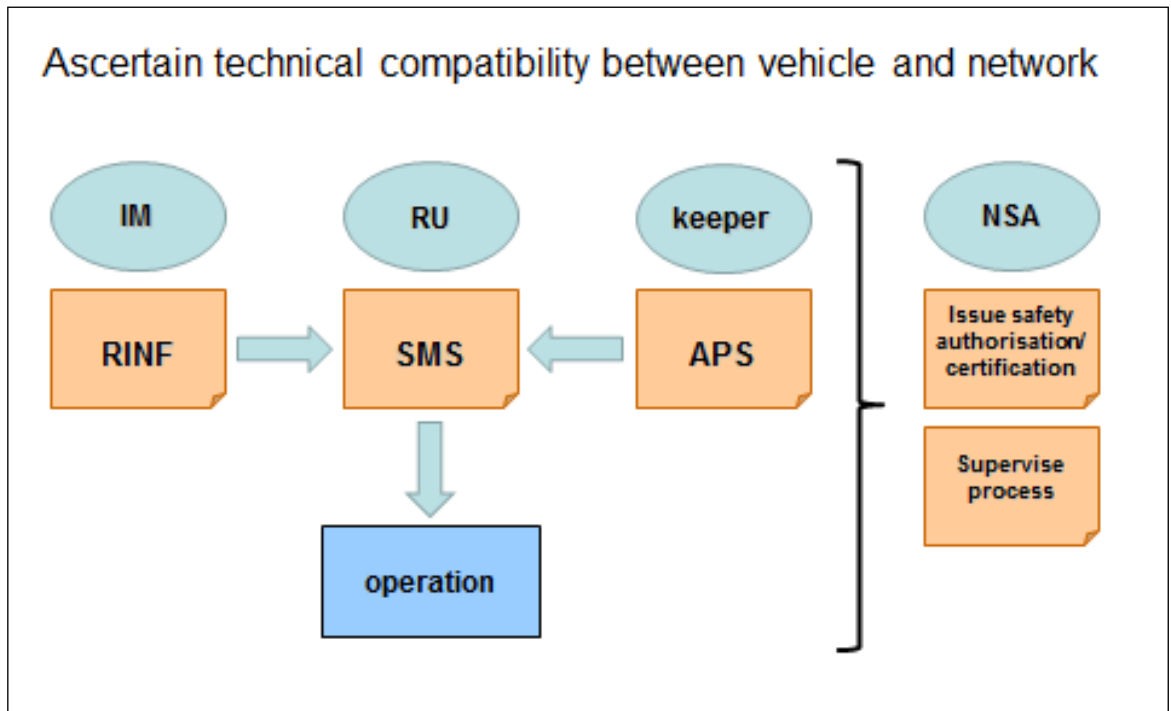


Figure 12: Ascertain technical compatibility between vehicle and network