



Open CCS On-board Reference Architecture

Acceptance of Global Standards

Assessment of railway sectoral needs

This OCORA work is licensed under the dual licensing Terms EUPL 1.2 (Commission Implementing Decision (EU) 2017/863 of 18 May 2017) and the terms and condition of the Attributions- ShareAlike 3.0 Unported license or its national version (in particular CC-BY-SA 3.0 DE).





Document ID: OCORA-BWS09-040

Version: 2.10

Date: 30.06.2022



Management Summary

The OCORA workstream on Acceptance of Global Standard aims to explore the strategy to be considered for improving competition and increasing economy of scale through the mean of re-using off-the-shelves components (COTS) which have been produced using alternative largely applied and well-recognized standards from other sector(s) of activities (Global Standards as defined here). 'Cross-Acceptance' is the fact that equivalence between two requirements of two different standards is recognized and has not to be redemonstrated each time. Cross-acceptance also includes cases where a re-demonstration is required, but only on particular specific issues. The benefit of cross-acceptance is expected to be particularly high with respect to RAMS assessment including safety assessment and risk evaluation.

This document summarizes the answers of railway stakeholders to our questionnaire, shared in the first weeks of February 2022. The OCORA collaboration received 17 answers with a considered application of cross-acceptance on Safety Standards (CENELEC EN 5012x with e.g. IEC EN 61508-x).

All the repliers showed interest in a cross-acceptance initiative. 75% of them are interested by a future cross-acceptance guideline.

This cross-acceptance guideline concerns the list of requirements that can be considered as "cross-accepted" or "not cross-acceptable" between the cited standards, and the supplementary requirements/conditions to fulfil in order to accept a Non-Railway Component.

The conditions of success of a cross-acceptance guideline are:

- A standardisation or a regulatory body should mandate to produce this guideline between two normative frameworks as a recommendation (not as a standard)
- The guideline should allow significant reduction of the workload compared to a complete recertification.
- The guideline should provide recommendations from unsuccessful attempts in the past

A clause-by-clause analysis is unavoidable as a starting point. Consequently, a high workload is needed at the beginning in order to achieve a cross-acceptance guideline.

The status of the guideline with respect to the legal framework is still an open point: it has been proposed as a standardized Technical Requirement, a referenced document in the regulatory framework, a recommendation (i.e. guideline), or an extension of the NBRAIL RFU-STR-0016 as a unique reference for assessor.

For the Applicant of a cross-acceptance approach, the following recommendations are drawn:

- The level of granularity at which cross-acceptance approach can be conducted and the legal framework for applying it are to be well-considered
- The understanding of the operational functioning and the management of the degraded modes of the subsystems remain essential
- The Non-railway components shall also comply with the relevant environmental conditions (temperature, shock, vibration, EMC conditions, etc.) and thus the relevant standards for its use profile.

The railway innovative improvement projects such as autonomous trains, use of Artificial Intelligence, localisation, innovative telecommunications and more globally all innovative ICT projects, suffers from the strict railway standards and the relatively small market of the railway industry. Cross-acceptance will help the railway industry to benefit from innovative solutions driven by other markets (e.g., automotive, aviation).







Revision history

Version	Change Description	Initial	Date of change
0.00	Gamma Release as a starting point	HAK	02/02/2021
1.00	Official version for OCORA Delta Release	HAK	26/06/2021
2.00	Official version for OCORA Release R1	HAK	23/11/2021
2.01	Initialisation of the document: new document for R2	HAK	07/03/2022
2.02	Comments from the BWS09 meeting	HAK	09/03/2022
2.03	Questionnaire recap	HAK	23/03/2022
2.05	■ BWS09 Comments + new answers	HAK	15/04/2022
2.06	■ BWS09 review meeting on 20/4/22 + clean version	HAK	20/04/2022
2.07	 BWS09 review on 25/5/22 SNCF and DB comments in meeting + SBB comments + References 	HAK	25/05/2022
2.10	Decoupled document from a specific OCORA release	HAK	30/06/2022







Table of contents

1	Introduction				
	1.1	Purpose of the document			
	1.2	Context of the document			
2	Response's metrics				
	2.1	Categories of the repliers			
	2.2	Interests for cross-acceptance			
	2.3	Conditions of success of a guideline on acceptance of global standards			
3	Review of the answers				
	3.1	Views	on the standards and products/components for a cross-acceptance	10	
		3.1.1	Out of scope Standards	11	
		3.1.2	The levels for cross-acceptance: Products /components cross-accepted	11	
		3.1.3	Tools and methods for cross-acceptance	12	
		3.1.4	Limits of the cross-acceptance approaches	13	
	3.2	Recommendations from the repliers			
		3.2.1	Solutions that can benefit from a cross acceptance	13	
		3.2.2	Rationalization or optimization of the cross-acceptance activities	14	
		3.2.3	Recommendations on the content of a cross-acceptance guideline	14	
4	Conclu	sion		15	
5	Annex: The questionnaire		16		
Table	e of fig	ures			
Figure 1	: categor	ies of the	e repliers	8	

Figure 2 : Stakeholders interested to actively contribute to future works9





References

Reader's note: please be aware that the numbers in square brackets, e.g. [1], as per the list of referenced documents below, are used throughout this document to indicate the references to external documents. Whenever a reference to a TSI-CCS SUBSET is used, the SUBSET is referenced directly (e.g. SUBSET-026). OCORA always references to the latest available official version of the SUBSET, unless indicated differently.

- [1] OCORA-BWS01-010 Release Notes
- [2] OCORA-BWS01-020 Glossary
- [3] OCORA-BWS01-030 Question and Answers
- [4] OCORA-BWS01-040 Feedback Form
- [5] OCORA-BWS03-010 Introduction to OCORA
- [6] OCORA-BWS04-010 Problem Statements
- [7] OCORA-BWS09-010 Acceptance of Global Standards







1 Introduction

1.1 Purpose of the document

The purpose of this document is to summarize the answers of railway stakeholders to the OCORA questionnaire (see $\S 0$







Annex: The questionnaire), shared in the first weeks of February 2022, on Acceptance of Global Standards. This document will help to understand the answers, obtain example of cross-accepted products in the railway industry and assess the need for a cross-acceptance guide focused on safety standards for the railway industry. In addition, this document will help to understand the needs of the railway sector and if a cross-acceptance guide will ease the certification process or not.

This document is addressed to experts in the CCS domain and to any other person, interested in the OCORA concepts for on-board CCS. The reader is invited to provide feedback to the OCORA collaboration and can, therefore, engage in shaping OCORA. Feedback to this document and to any other OCORA documentation can be given by using the feedback form [4].

1.2 Context of the document

The OCORA workstream on Acceptance of Global Standard aims to explore the strategy to be considered for improving competition and increasing economy of scale through the mean of re-using off-the-shelves components (COTS) which have been produced using alternative largely applied and well-recognized standards from other sector(s) of activities (Global Standards as defined here).

Cross-Acceptance [of a product, system or process]: is 'an aspect of the technical and legal process principally aimed at establishing the fastest route to the deployment of a Product, System or Process in a target (new) context or environment. The Product, System or Process considered for cross-acceptance is generally assumed to satisfy the qualifications for acceptable levels of reliability, safety and environmental performance in their native (original) context or environment'.

Cross-Acceptance' is understood as the fact that equivalence between two requirements of two different standards is recognized and has not to be re-demonstrated each time. Cross-acceptance also includes cases where a re-demonstration is required, but only on specific issues.

The considered scope for cross-acceptance has been set within this inquiry to Safety Standards (CENELEC EN 5012x with e.g. IEC EN 61508-x).

This document is published as part of the OCORA Release, together with the documents listed in the release notes [1]. Before reading this document, it is recommended to read the Release Notes [1]. If you are interested in the context and the motivation that drives OCORA we recommend to read the Introduction to OCORA [5], and the Problem Statements [6]. The reader should also be aware of the Glossary [2] and the Question and Answers [3]. For a complete understanding of this document and his context the reader should read the document Acceptance of Global Standards [7].







2 Response's metrics

2.1 Categories of the repliers

The OCORA collaboration has received 17 answers. The graph here-under shows the repartition of the categories of the repliers. Some repliers represent both Railway Undertakings and Infrastructure Managers.

The supplier category covers the companies that assemble railway subsystems.

The manufacturers category is dedicated to companies that builds hardware and software solutions usable in the railways systems.

Around 40% of the replies originate from the manufacturers. They indicated to be mostly interested by providing their components or building blocks to different sectors of activities.

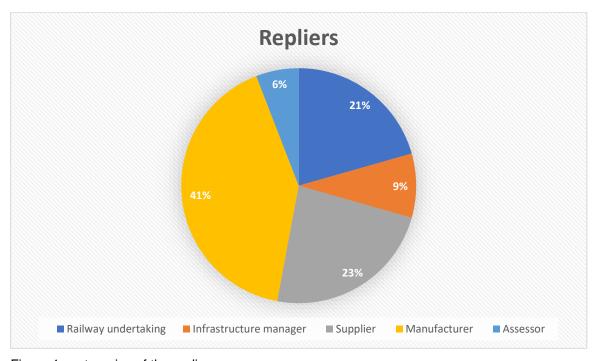


Figure 1: categories of the repliers

2.2 Interests for cross-acceptance

All the repliers showed interest in a cross-acceptance initiative. Due to a lack of available time, four of them declared that they will not participate to future work on acceptance of global standards like writing a cross-acceptance guideline. Yet, one out of those three repliers is ready to support as a potential reviewer of this guideline.

All categories of repliers (RU, IM, Suppliers, Manufacturers and Assessors) are supportive and willing to actively contribute.





Figure 2: Stakeholders interested to actively contribute to future works

2.3 Conditions of success of a guideline on acceptance of global standards

This cross-acceptance guideline concerns:

- The list of requirements that can be considered as "cross-accepted" between the cited standards;
- The list of requirements that <u>cannot</u> be considered as "cross-acceptable" and thus need to be demonstrated according to railway standards only;
- And the supplementary requirements/conditions to fulfil in order to accept a Non-Railway Component
 which was originally developed and approved with an alternative Standard, meaning that the
 requirements of the alternative standards are either comparable in terms of requirements or need
 additional demonstrations.

The group in charge of writing the guideline should have a clear mandate from a standardisation or regulatory body:

One main point of the replies was the need of a clear mandate from either a standardisation body or a regulatory body to ensure the applicability of a cross-acceptance guideline.

The general view is that this guideline should be fully accepted and approved by the railway sector, meaning: industry of manufacturers, suppliers, Notified Bodies/ Assessment Bodies, the operators (IMs and RUs), National Safety Authorities, and ERA as ERTMS System Authority and Safety Authority for vehicles (including their CCS part).

• The guideline should lead to reduction of the workload:

The objective of this guideline is to provide less workload than a clause-by-clause approach and cover all phases of the development and manufacturing process of a product. This guideline is to address the major differences between the considered standards.







The guideline should be a recommendation, not a standard:

There is an open point where the positions differ, regarding the status of such a guideline: should it be a harmonized standard or part of regulation or a recommendation? The wording "guide or guideline" can be therefore misleading, it was used with the sense of a recommendation. It is recommended by one railway operator that this guideline remains a recommendation, and it should not become a standard, nor enter a regulation. The recommendation of the Assessors is to integrate this guideline as an extension of the RFU-STR-016 delivered by NBRAIL, in order to provide ways to harmonize risk and safety classification and targets to facilitate the cross-acceptance process. Many different guidelines are to be avoided.

In order to do so, we have so far considered as OCORA that the creation of the guideline should be conducted under the umbrella of the Europe's Rail initiative or the European standardisation Organization CENELEC involving assessors, RUs, IMs, suppliers and manufacturers.

The guideline should provide recommendations from unsuccessful attempts in the past:

Unsuccessful experiences on cross-acceptance from IEC EN 61508x to CENELEC 5012x are also mentioned. Those experiences were the result of refusal of exported constraints in connection with quantified safety objectives. Conformity to the CENELEC 5012x standard was then requested. The difficulties and the limits of this cross-acceptance approach were linked to;

- 1. the functional understanding of the system.
- and the management of degraded modes of the subsystem.

A cross-acceptance guideline would be worth only if it addresses the items of unsuccessful cross-acceptance experienced in the past as listed above.

Assessors have no difficulties when all the conditions of RFU-STR-016 are met. Examples of assessors' difficulties, i;e. of unfilled RFU-STR-016 conditions:

- Other standards are applied
- No safety case available
- No ISA Report available
- Detailed description of the product is not available
- Detailed standards are not available, or not appropriate
- Exported constraints are not available
- Methodology for safety demonstration is not available, or not appropriate
- Product "proven in use" but without "proof"
- Qualification and impartiality of the ISA is not demonstrated

3 Review of the answers

3.1 Views on the standards and products/components for a crossacceptance

As assumed in previous OCORA BWS09 releases, the railway domain can benefit from products/components from other sectors, the replies support this view.

The following standards have been used to try cross acceptance with the railway industry:

6 different repliers report attempts to establish a cross-acceptance between the IEC EN 61508 Functional safety of electrical/electronic/programmable electronic and the railway specific safety standards EN 5012X







- One replier (which never applied cross-acceptance) mentions that a correspondence may be possible between the nuclear industry standards and the railway safety standards, they see a possible correspondence between IEC 61513 RCC-E Nuclear rules and CENELEC EN 5012x regarding general purpose, IEC 62566 and CENELEC EN 50129, and IEC 60880 and CENELEC EN 50128
- One replier tries to compare railway and avionic using DO 254 for hardware and DO 178 for software
- There is a need to consider avionics equipment certified against DAL according to DO 178 if it is embedded into a larger system, which is certified as a whole against the legally applicable CENELEC EN 5012x standards

The great number of attempts (mainly from manufacturers working with other industries) to connect the IEC EN 61508 to railway projects is based on the fact that the IEC EN 61508 is the fundamental standard for safety and the railway standards are historically derived from it.

3.1.1 Out of scope Standards

Compliance with other standards than Safety Standards remains a necessity:

The interest shown by the repliers went beyond the only scope of railway safety standards. Several replies pointed out that apart from the safety standards also other standards need to be considered, such as environmental conditions (temperature, shock, vibration etc.), EMC conditions standards etc.

Since the conditions cited above are really different for each of these use cases (railway vs cars vs avionics vs space vs nuclear...), OCORA will limit (at least for now) its scope to the safety standards as cited above.

3.1.2 The levels for cross-acceptance: Products /components cross-accepted

The level of granularity at which cross-acceptance approach can be conducted and the legal framework for applying it are to be well-considered and agreed:

Cross-acceptance has been made on various types of products by the repliers:

- At manufacturer level, cross-acceptance comparison is used often in internal processes to ease the developments and the evolutions needed to fit the railways requirements.
- Five of them used a cross-acceptance method on a subsystem (interlocking system, axel counter, warning track protection ...), 5 also used this method at a component level (chipset, ...).
- One of the manufacturers also uses cross-acceptance for software components and operating systems.

For a railway operator it seems more difficult to use cross acceptance at a single component level. This possibility seems more interesting for the manufacturers of subsystems to be integrated in a future OCORA architecture. The approach is summarized by one supplier as follows in the case of an IMU1: 'The intention of OCORA is understood as to declare the IMU as a separate sub-system of the ETCS on-board system, which can be procured independently from the other sub-systems, and then be combined with those other, also individually procured sub-systems to form an ETCS on-board system (under whose responsibility for the onboard system?). This however means that each sub-system will have to be certified as a separate constituent against the relevant regulations (which refer to EN5012x), requiring detailed functional and interface standards, test specifications, SIL2 requirements (from a safety analysis), etc'. The level of granularity at which a crossacceptance approach can be undertaken and the legal framework for applying it are therefore to be wellconsidered and agreed.

The Assessors today apply acceptance activities as foreseen in CENELEC Standard, for "Generic Product", "Generic Application", and "Specific Application". The definition of the architecture and number of Safety case (GPSC, GASC, SASC) is the responsibility of the Applicant.

For an On-Board ATP, examples of safety case are:

- Tools when these are safety-critical
- Electronic Board (Vital I/O, Power Supply, ...)





¹ Inertial Measurement Unit

² Safety Integrity level



- Safety Platform (GPSC)
- Library, Driver (when safety critical)
- Sensors (GPSC)
- Tag Reader (GPSC)
- Odometer (GASC)
- Display Unit (when safety critical)
- On-Board assembly (GASC)
- On-Board assembly (SASC) (with configuration data for particular trains)

The assessor reminds that, in today's practices, it is the responsibility of the applicant to define the strategy towards certification, meaning the cross-acceptance between standards is not under the responsibility of the assessor. The Assessor is responsible to assess the methodology towards risk evaluation and assessment ("The approach chosen for demonstrating compliance with the safety requirements as well as the demonstration itself shall be independently assessed by an assessment body", according to §3.3 of Commission Implementing Regulation (EU) No 402/2013 of 30 April 2013 on the common safety method for risk evaluation and assessment and repealing Regulation (EC) No 352/2009).

3.1.3 Tools and methods for cross-acceptance

3.1.3.1 Clause by clause approach

A clause-by-clause analysis appeared unavoidable as a starting point:

Eight companies confirm they use the clause-by-clause approach, the first step is then the expert incorporation of the standards into a requirement management tool.

The companies have different ways to handle the clause by clause:

- Some companies perform the clause by clause on existing products, trying to find the extra requirements needed to be compliant with the railway industry.
- Others use the cross-acceptance at earlier stages of production. During the development of the products, they use a clause by clause to define core requirements shared by multiple industry standards, then specialise the product depending on the target industry.
- One manufacturer uses the clause-by-clause method by developing a compliance document (possibly on each standard) and use this document to express their compliance and provide the justification in case of uncovered 'Highly Recommended' clauses. This document can be useful at the certification stage as evidence for the assessors.

The answer of the assessor suggests that they are not involved in any cross-acceptance or clause by clause process, they highlight that the applicant must produce the needed documents to show the conformities. The assessors rely on the conditions written in the RFU-STR-016.

3.1.3.2 Other proposed approaches

All the repliers among the manufacturers that experienced cross-acceptance used a clause-by-clause approach.

Another quoted approach is to rely as much as possible on validation, certification or homologation work done elsewhere:

- At least, the product or system must be used on a foreign railway network or certified by a recognized certification body;
- An analysis of the functional and technical needs of the product/system and the adequacy of its





12/16



current use with regard to its future use must be carried out;

Elements on the quality and the conditions having allowed its use (the return of experience) must be known.

3.1.4 Limits of the cross-acceptance approaches

Beyond cross-acceptance, the understanding of the operational functioning and the management of the degraded modes of the subsystems remain essential:

From the operator's point of view, the main difficulty is to consider the operational functionalities and risks. The cross-acceptance based on requirements comparison is important and interesting, but they cannot replace the understanding of the operational functioning of the systems and the management of degraded modes of the subsystems.

A high workload is needed at the beginning in order to build a cross-acceptance guideline:

One shared difficulty is the number of requirements defined in each standard implying a "high workload for initialization" of the process. These numerous requirements led to a set of limitations experienced by the repliers:

- Variance between the standards requires to make only one choice during qualification process;
- Depending on the initial industry of the product some core specifications are incompatible. For example, the differences between the safe state in railway industry and the safe state in aeronautics;
- Over-engineering to avoid uncertainties and complex mitigations

As for their other answers the assessor reminds that the applicants are responsible of furnishing the needed documents for the assessment. So, the main difficulties are at the applicant level, the assessor relies on the RFU-STR-016.

3.2 Recommendations from the repliers

3.2.1 Solutions that can benefit from a cross acceptance

The railway innovative improvement projects such as autonomous trains, use of Al3, localisation, innovative telecommunications and more globally all innovative ICT4 projects, suffer from the strict railway standards and the relatively small market of the railway industry. Cross-acceptance will help the railway industry to benefit from innovative solutions driven by other markets (e.g., automotive, aviation).

Some repliers gave some concrete examples of foreseen technical evolutions:

- One Manufacturer believes that the communication backbone of a railway system could rapidly adopt DDS⁵ to ensure compliance against EN 5012X, and possibly cybersecurity.
- One Manufacturer believes that some technical solution used for example in automatic driving vehicle which refer to other standard (ISO26262) could also be used in the railway domain.
- One Manufacturer believes IMUs⁶ certified against DAL⁷ standards (avionics) should be used in an





³ Artificial Intelligence

⁴ Information and communication technologies

⁵ Data-Distribution Service for Real-Time Systems® (DDS®) is an open international middleware standard directly addressing publishsubscribe communications for real-time and embedded systems

⁶ Inertial Measurement Unit

⁷ Design assurance level



OCORA type of setup where IMUs can be supplied by different manufacturers.

3.2.2 Rationalization or optimization of the cross-acceptance activities

To the extent that the standards are similar, leveraging investments made toward certification against one standard offers benefits to many organizations. Customers and suppliers both benefit from faster time-to-market without additional risk to safety.

It is important that the technical risks calculation is the same (e.g. probability in aeronautics vs HFR for railways). The equivalence must also cover aspects of quality and safety management to guarantee an expected SIL including considerations of systematic faults. For this type of faults, no mathematical analysis can be done, as stated by standards. When being adopted in automated train operation (ATO) systems the definition of Grades of Automations (GoA 1->4) must also be equivalent between domains.

No suggestions were given regarding the possible improvement of the environmental tests that need to be conducted anyway.

A clause-by-clause analysis appeared unavoidable as a starting point. Afterwards, it can take advantage of collective knowledge to identify the additional demonstrations or assessments that need to be conducted in order to comply with different standards.

The guideline must be designated by the applicant at the beginning of the tendering phase and be recognized as applicable by the different parties.

• Cross-acceptance would require assessment of the off-domain evaluation method

According to the Assessors, the cross-acceptance of off-domain standards require to check both that the certifier is a capable entity (in general terms), and the way the product was evaluated and the correlation between the results. The safety levels between standards, even if sometimes they have the same names and classifications, are not exactly the same though the cross acceptance and possible adaptations on the risks and safety level references should be done. Although as the principle of a safety analysis remains the same, it should be possible to define a method to rationalize this inter-domain cross acceptance. Another difficulty is to be able to justify the gap between standards, when one of them is not a CENELEC Standard. Until now, it is not demonstrated that an equipment recognized with SIL4 according IEC61508, it is also a SIL4 according CENELEC Standard.

3.2.3 Recommendations on the content of a cross-acceptance guideline

In addition to the conditions of success of the guideline listed in § 2.3 and the limits of the guideline identified in § 3.1.4, the following recommendations were made by the repliers:

- The guideline should be unambiguous about the consequences of deviations in terms of security and safety⁸ level (possibly including cybersecurity).
- The guideline should be simple.
- The guideline should identify and discuss showstoppers (e.g. impossibilities to obtain a cross-acceptance). Technical expertise may be needed with additional activities to consider that the cross-acceptance is done. Acceleration with cross-acceptance seems therefore not given and may largely depend on the component under consideration (in terms of complexity, and certification background).
- The guideline should contain clearly defined rules on a case-by-case level, backed by a legal framework. The guideline may not be sufficient and specific analysis will remain necessary.
- The guideline should address the limits of certificates in terms of environment, conditions of use or mission profiles, which can be very different depending on the technical field.
- The guideline should lead to less workload than a clause-by-clause approach done for each project.
- The guideline should at least address IEC EN 61508-x and DO-178C, and it should cover the demonstration from DAL X to SIL Y, but not only.
- The guideline should be practical and provide a real added-value in the cross-acceptance.





⁸ Security and safety may have inversed definition depending on the domain of activity



- This guideline should be structured to cover e.g. technical and organizational aspects. The following topics should be well separated: Environmental, security and safety including cybersecurity, and functional.
- There should be an official acceptance of the guideline, e.g. assessed by independent organization / committee.
- The clause-by-clause analysis should be annexed to the cross-acceptance guideline. This ensures the transparency of the guideline and allows following the requirements in the guideline.

•

4 Conclusion

Upon the received answers to our questionnaire (17 answers received for suppliers, manufacturers, RU/IM and assessors):

All the repliers showed interest in a cross-acceptance initiative.

The cross-acceptance of a product, system or process for different sectoral industries is today usually performed based on a clause-by-clause analysis made by manufacturers, i.e. suppliers of components to be integrated in a railway (sub)system.

The safety standards to be considered for cross-acceptance are the IEC EN 61508, the avionics sector standards (DO 254 and DO 178C) or the nuclear sector standards (IEC 61513, IEC 62566 and IEC 60880).

With respect to safety demonstration and analysis, the level at which this cross-acceptance is performed will have to be well defined and agreed between the parties: suppliers/manufacturers, the integrator, and the users/contractors (RUs and IMs)

A guideline document on cross-acceptance is welcome by 75% of the repliers. This guideline will have to be based on a consensual agreement between suppliers, manufacturers, integrator, assessors, users/contractors (Rus and IMs), NSAs and the European Union Agency for Railways. The status with respect to the legal framework is still an open point: it has been proposed as a standardized Technical Requirement, a referenced document in the regulatory framework, a recommendation (i.e. guideline), or an extension of the NBRAIL RFU-STR-0016 as a unique reference for assessor.

A guideline on cross-acceptance between two standards would require an initial clause-by-clause analysis annexed to it. The guideline should then identify the additional assessments/demonstrations to be performed and the list of requirements that **cannot** be considered as "cross-acceptable" and thus need to be demonstrated according to railway standards only.

The guideline should also identify the additional activities and expertise to be able to finalize this cross-acceptance. Those additional activities should aim at demonstrating a proper understanding of operational functioning of the system and the management of degraded modes of the subsystems.

The COTS shall also comply with the relevant environmental conditions (temperature, shock, vibration, EMC conditions, etc.) and thus the relevant standards for its use profile.







5 Annex: The questionnaire

On which norms have you been applying a cross-acceptance process with safety railway norms as defined above?

How frequent this cross-acceptance has been necessary? (on each project, on various projects, on one project only)

If applicable, at which level and on which product this cross-acceptance has been applied, e.g.: a chipset, a technical component or a sub-system?

How did you approach the cross-acceptance of components/sous-system emerging from different sectors in terms of methods/tools/redesign?

Did you use a clause-to-clause approach? If applicable, how efficient was it?

What have been your difficulties and the limit of the approach you had applied?

How do you foresee a rationalization or an optimization of the cross-acceptance activities in order to simplify and to accelerate this cross-acceptance?

Is this need for cross-acceptance linked to the introduction of an innovative solutions in a product or in a subsystem? In that case, which innovative solution is requiring or would require a cross-acceptance approach?

Do you see a need for a cross-acceptance guideline as defined above? On which specific items?

Would you be interested in participating to the writing of such a guideline?

What would be your recommendations in terms of contents for this guideline?

If such a guideline would exist, under which condition would you apply it?



