ERTMS Unit

Criteria for the ERTMS Laboratories

version	v 5
date	19/10/2009
approval	endorsed by the ERTMS MoU Steering Committee on the 19/10/2009

1. Aim

This proposal addresses the point 36 of the Memorandum of Understanding (MoU) signed on 4th of July 2008 in Rome by the EC and the European Railway Associations (CER, EIM, ERFA, GSM-R IG, UIC and UNIFE):

"The Parties ask ERA, in cooperation with the sector, to draw up a list of criteria to be fulfilled by laboratories or test centres so that they could be used as "reference laboratories". Such laboratories or test centres should be able to provide an appropriate platform to test on board ETCS and GSM-R equipment."

2. Assumptions and prerequisites

The ERTMS specifications, part of the TSI CCS, fulfill the objectives of the interoperability directive, in particular by allowing "the safe and uninterrupted movement of trains with the required levels of performance". The following describes in more details the situation to be reached in the target situation, which is laid down in the TSI ch. 6.

The on-board equipments and subsystems (ETCS and GSM-R) shall comply with specifications that fully define all aspects (functions, performances, interfaces) relevant for the interaction with trackside.

An on-board subsystem that has successfully passed the verifications against the relevant specifications (i.e., a certified subsystem) cannot be refused authorisation to run on interoperable infrastructures (under the sole conditions and limitations explicitly stated in the TSIs).

The Infrastructure Manager, when equipping a line in accordance to the Interoperability Directive, is responsible to ensure that the trackside subsystems are so designed and implemented to accept any certified on-board.

When testing the "integration" between a certified on-board and an infrastructure, the "object under test" is the infrastructure.

It is therefore essential that the ERTMS specifications are complete and accurate, to avoid (minimize) the consequences of errors in the specifications resulting in interoperability problems with constituents and systems.

3. Validation vs Testing

The validation of the specifications is the process by which the Agency and the Sector can gain the confidence that the ERTMS specifications are in a fit state to be recommended to the Commission for inclusion in the legal reference.

The manufacturer is responsible to deliver the 'EC' declaration of conformity or suitability for use of an interoperability constituent. The use of comprehensive test specifications and test laboratories is a major step in the process of demonstrating the conformity with the requirements.

Validation of specifications and testing of products are two different phases, separated also in terms of temporal sequence. Nevertheless, it is recognized that there can be synergies and mutual influences between the activities pertaining to validation and those carried out for the testing: this must be taken into account without blurring the difference between the two phases of the life cycle.

According to the Directive, the assessment of the conformity or suitability for use of an interoperability constituent shall be carried out by the Notified Body selected by the applicant. The Notified Body is involved in all implementation phases, specifically in the testing.

For the test phase, normally a Notified Body makes use of testing facilities belonging to third parties.

In the following we list the types of tests and the corresponding requirements on the test facilities that can be used at different stages of the process: the process itself is defined in the TSI, not in this document.

1 tests for the certification of ICs. For these tests the knowledge of the relevant specifications referenced in the TSI (see chapter 6 and table in chapter 5) is required; the laboratory must have appropriate simulators of the IC environment. These laboratory tests are sufficient for the certification; no on-site test is normally required.

2 tests for the functional integration verification of OB assembly. Reference shall be made to CCS TSI chapter 6.2.1.1. These tests may be performed in a depot on the prototype installation.

3 tests for the functional integration verification of TS assembly. The scope of the laboratory tests is to minimise the amount of on-site tests. Reference shall be made to CCS TSI chapter 6.2.1.2; the laboratory must have simulators of the track, a test description and a fully compliant ETCS on-board equipment.

4 testing in a laboratory for the final check of compatibility between an on-board installation and a trackside installation (see TSI 6.2.2.3.1 and 6.2.2.3.2). The scope of this phase is the detection of systematic failures in both on-board and trackside equipment, that have not been detected in the previous phases and that may appear under specific operational conditions and specific trackside implementation choices. The scope of the laboratory tests is to minimise the amount of on-site tests (test runs). The laboratory must allow the communication between ETCS and or GSM-R on-board and trackside equipment in a simulated environment, using a reference test description for the specific application.

5 testing in full operational conditions for the final check of compatibility between an on-board installation and a trackside installation (see TSI same as above). The scope of this phase is the detection of remaining failures in both on-board and trackside equipment, that have not been detected in the previous phases and that may appear under specific operational conditions and

specific trackside implementation choices. The scope of the tests is to minimise the amount of tests (test runs) on commercially operated lines – The laboratory must have a test facility that offers the possibility to run test trains on test tracks as close as possible to real system, using a est description for the specific application.

This document discusses the accreditation requirements for laboratories; it is noted that similar requirements for the accreditation of Notified Bodies apply.

The rest of this document is dedicated to the definition of the criteria for the ERTMS laboratories in view of their use in the testing of products.

4. Legal Framework for test laboratories

➢ *New EU Regulation and Decision focusing on accreditation*

Recently a Regulation and a Decision dealing with market surveillance and marketing products have been adopted:

- REGULATION (EC) No 765/2008 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 9 July 2008 setting out the requirements for accreditation and market surveillance relating to the marketing of products and repealing Regulation (EEC) No 339/93 http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2008:218:0030:0047:EN:PDF

- DECISION No 768/2008/EC OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 9 July 2008 on a common framework for the marketing of products, and repealing Council Decision 93/465/EEC http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2008:218:0082:0128:EN:PDF

This framework addresses the importance of accreditation for testing activities intended to prove conformity for products to be put in the market.

➢ *Standards for accreditation of test laboratories*

ISO 17025:2005 is the international recognized standard for the accreditation of the testing laboratories. While quality management standards (ISO9000 series) certify the application of quality management system, the accreditation standards also cover the technical competence of the body.

To be awarded with an ISO 17025 accreditation the laboratory must document a quality management system and a documented quality manual. In addition, quality management procedures must be established demonstrating how the system is maintained. Once the system is documented it must be implemented in the laboratory and will also accompany the laboratory's application for accreditation. The laboratory must demonstrate technical competence against the test standards that are applied. The implementation period will require several months to establish the records that an accreditation body will review with accreditation audit(s). Finally, the laboratory undergoes the ISO 17025 assessment by an accreditation body that is certified to perform laboratory accreditation.

➢ *Accreditation system*

The laboratory is accredited by a national accreditation body, with authority derived from the Member States where the laboratory is located.

➢ *Accreditation Bodies Network*

Currently the National Accreditation Bodies are coordinated under the umbrella of EA, European Co-operation for Accreditation, a nonprofit association which was set up in November 1997 and registered as an association in the Netherlands in June 2000.
EA is the European network of nationally recognized accreditation bodies based in the European geographical area and is in coordination with EC through DG-Enterprise.

In particular the EA Laboratory Committee (EA/LC) is the forum for discussion of all questions related to the assessment and accreditation of laboratories and deals with the accreditation of laboratories against ISO/IEC 17025 and other relevant standards and to elaborate guidance documents where necessary.

5. Current status

In the past, the ETCS suppliers, members of UNISIG, have recognized CEDEX as a reference laboratory for ETCS test campaigns for IC certification. The DLR ETCS laboratory has also developed experiences and knowledge of an equivalent level. More recently another laboratory, Multitel, has also expressed its willingness to work in the testing activities in the ETCS system. Today there is no test-lab accredited for GSM-R. There are the test-labs of Nortel and NSN in Friedrichshafen and Bern, which are supplier-dependent and there are two other test-labs used in railway environment (Eschborn in Germany and RFI lab in Rome).

The concept of “reference laboratory” for ERTMS is not directly defined by the applicable legal framework (Interoperability Directives, Technical Specifications for Interoperability). In the rest of the document, the term “reference laboratory” will be used to indicate laboratories that comply with the criteria set forth in this proposal. The criteria are intended to be valid for ETCS and for GSM-R laboratories.

As far as the Agency knows, the current situation is that CEDEX is accredited in accordance with ISO 17025 for Eurobalise testing by ENAC (Spanish accreditation body), DLR is accredited by DAP/DACH (German accreditation bodies) for other activities not related to ERTMS testing.

6. ERA Proposal

The aim of the proposal is to improve the confidence in mutual recognition of the testing results, bring more clarity and transparency for the testing activities and facilitate the work of the Notified Bodies. Criteria:

I) Accreditation of reference laboratory:
The accreditation of the testing activities will improve the current situation and align the ERTMS system with the recent European strategies for accreditation and common market (see point 2). This accreditation process should be carried out by the laboratory in accordance with the national accreditation system, with reference to the specific test standards. To be accredited the laboratories shall justify and proof experience in ERTMS testing, provide testing traceability and test recordings (see ISO:17025 point 4.13) of real tests on ERTMS products.

II) Peer review:
The results coming from an accredited laboratory shall be accepted with confidence by the entire sector. To build this confidence, each reference laboratory shall detail a program of peer reviews, to be agreed with EC and ERA. The peer review evaluation process shall focus on:

- Quality management
- Testing protocols
- Best practices and methodologies
- Inconsistencies and error management
- Recording analysis

III) Traceability and transparency:
The reference laboratories commit to report promptly to EC ERA , and the contracting parties (suppliers, infrastructure managers and railway undertakings involved) any problem encountered in the test, especially in the case of problems that can be traced to the specifications themselves, and shall be available to discuss with ERA the results and details of the tests, (confidentiality of products/assemblies shall be guaranteed).

Note: the Decision 768/2008/EC (art. R21) restricts the use of “in-house bodies” to the case of application of modules A1, A2, C1 or C2, which are not allowed for ERTMS equipment.

7. Evolution of this document

Changes to this document will be managed by discussion and agreement in the ERTMS MoU Steering Committee.

8. Appendix: ETCS tests specifications currently listed in Annex A of the TSI CCS:

TITLE	SUBSET
On board Unit testing	Suite of documents from Subset-076
Functional Requirements for an On-board Reference Test Facility	Subset-094
Test specification for Interface “k”	Subset-102
STM Testing	Suite of documents from Subset-074
ERTMS EuroRadio Test cases Safety Layer	Subset-092
JRU Test Specification	Subset-028. Reserved
Test Specification for Eurobalise FFFIS	Subset-085
Test specification for EUROLOOP	SUBSET-103. Reserved
RBC-RBC Test specification for Safe Communication Interface	SUBSET-099. Reserved

9. Appendix: GSM-R tests specifications currently listed in Annex A of the TSI CCS:

TITLE	SUBSET
Test specification for mobile equipment GSM-R	reserved index 48
ERTMS GSM-R QoS Test Specification	informative document O2475