BS EN 50463-5:2012

BSI Standards Publication

Railway applications — Energy measurement on board trains -

Part 5: Conformity assessment

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National foreword

This British Standard is the UK implementation of EN 50463-5:2012. Together with BS EN 50463-1:2012, BS EN 50463-2:2012, BS EN 50463-3:2012 and BS EN 50463-4:2012 it supersedes BS EN 50463:2007, which is withdrawn.

The UK participation in its preparation was entrusted to Technical Committee GEL/9, Railway Electrotechnical Applications.

A list of organizations represented on this committee can be obtained on request to its secretary.

This publication does not purport to include all the necessary provisions of a contract. Users are responsible for its correct application.

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Compliance with a British Standard cannot confer immunity from legal obligations.

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Applications ferroviaires - Mesure d'énergie à bord des trains - Partie 5: Evaluation de la conformité

Bahnanwendungen - Energiemessung auf Bahnfahrzeugen - Teil 5: Konformitätsbewertung

CENELEC

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Contents

Figures

Foreword

This document (EN 50463-5:2012) has been prepared by CLC/TC9X "Electrical and electronic applications for railways".

The following dates are proposed:

- latest date by which this document has to be implemented at national level by publication of an identical national standard or by endorsement (dop) 2013-10-15
- latest date by which the national standards conflicting with this document have to be withdrawn (dow) 2015-10-15

This document (EN 50463-5:2012), together with parts 1, 2, 3 and 4, supersedes EN 50463:2007.

EN 50463-5:2012 includes the following significant technical changes with respect to EN 50463:2007:

— the series is based on and supersedes EN 50463:2007;

— the scope is extended, new requirements are introduced and conformity assessment arrangements are added.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CENELEC [and/or CEN] shall not be held responsible for identifying any or all such patent rights.

This document has been prepared under a mandate given to CENELEC by the European Commission and the European Free Trade Association, and supports essential requirements of EU Directive(s).

For relationship with EU Directive 2008/57/EC amended by Commission Directive 2011/18/EU, see informative Annex ZZ, which is an integral part of this document.

This document is Part 5 of EN 50463 which consists of the following parts, under the common title *Railway applications — Energy measurement on board trains*:

Part 1, General;

Part 2, Energy measuring;

Part 3, Data handling;

Part 4, Communication;

Part 5, Conformity assessment.

This series of European Standards follows the functional guidelines description in Annex A “Principles of conformity assessment” of EN ISO/IEC 17000 tailored to the Energy Measurement System (EMS).

The requirements for Energy Measurement Systems in the relevant Technical Specifications for Interoperability are supported by this series of European Standards.

Introduction

The Energy Measurement System provides measurement and data suitable for billing and may also be used for energy management, e.g. energy saving.

This series of European Standards uses the functional approach to describe the Energy Measurement System. These functions are implemented in one or more physical devices. The user of this Series of standards is free to choose the physical implementation arrangements.

Structure and main contents of EN 50463

This series of European Standards is divided into five parts. The titles and brief descriptions of each part are given below:

EN 50463-1 – General

The scope of EN 50463-1 is the Energy Measurement System (EMS).

EN 50463-1 provides system level requirements for the complete EMS and common requirements for all devices implementing one or more functions of the EMS.

EN 50463-2 – Energy measuring

The scope of EN 50463-2 is the Energy Measurement Function (EMF).

The EMF provides measurement of the consumed and regenerated active energy of a traction unit. If the traction unit is designed for use on a.c. traction supply systems, the EMF also provides measurement of reactive energy. The EMF provides the measured quantities via an interface to the Data Handling System.

The EMF consists of the three functions: Voltage Measurement Function, Current Measurement Function and Energy Calculation Function. For each of these functions, accuracy classes are specified and associated reference conditions are defined. This part also defines all specific requirements for all functions of the EMF.

The Voltage Measurement Function measures the voltage of the Contact Line system and the Current Measurement Function measures the current taken from and returned to the Contact Line system. These functions provide signal inputs to the Energy Calculation Function.

The Energy Calculation Function inputs the signals from the Current and Voltage Measurement Functions and calculates a set of values representing the consumed and regenerated energies. These values are transferred to the Data Handling System and are used in the creation of Compiled Energy Billing Data.

The standard has been developed taking into account that in some applications the EMF may be subjected to legal metrological control. All relevant metrological aspects are covered in this part of EN 50463.

EN 50463-2 also defines the conformity assessment of the EMF.

EN 50463-3 – Data handling

The scope of EN 50463-3 is the Data Handling System (DHS).

The on board DHS receives, produces and stores data, ready for transmission to any authorised receiver of data on board or on ground. The main goal of the DHS is to produce Compiled Energy Billing Data and transfer it to an on ground Data Collection Service (DCS). The DHS can support other functionality on board or on ground with data, as long as this does not conflict with the main goal.

EN 50463-3 also defines the conformity assessment of the DHS.

EN 50463-4 – Communication

The scope of EN 50463-4 is the communication services.

This part of EN 50463 gives requirements and guidance regarding the data communication between the functions implemented within EMS as well as between such functions and other on board units where data are exchanged using a communications protocol stack over a dedicated physical interface or a shared network.

It includes the on board to ground communication service and covers the requirements necessary to support data transfer between DHS and DCS.

EN 50463-4 also defines the conformity assessment of the communications services.

EN 50463-5 – Conformity assessment

The scope of EN 50463-5 is the conformity assessment procedures for the EMS.

EN 50463-5 also covers re-verification procedures and conformity assessment in the event of the replacement of a device of the EMS.

EMS functional structure and dataflow

Figure 1 illustrates the functional structure of the EMS, the main sub-functions and the structure of the dataflow and is informative only. Only the main interfaces required by this standard are displayed by arrows.

Because the communication function is distributed throughout the EMS, it has been omitted for clarity. Not all interfaces are shown.

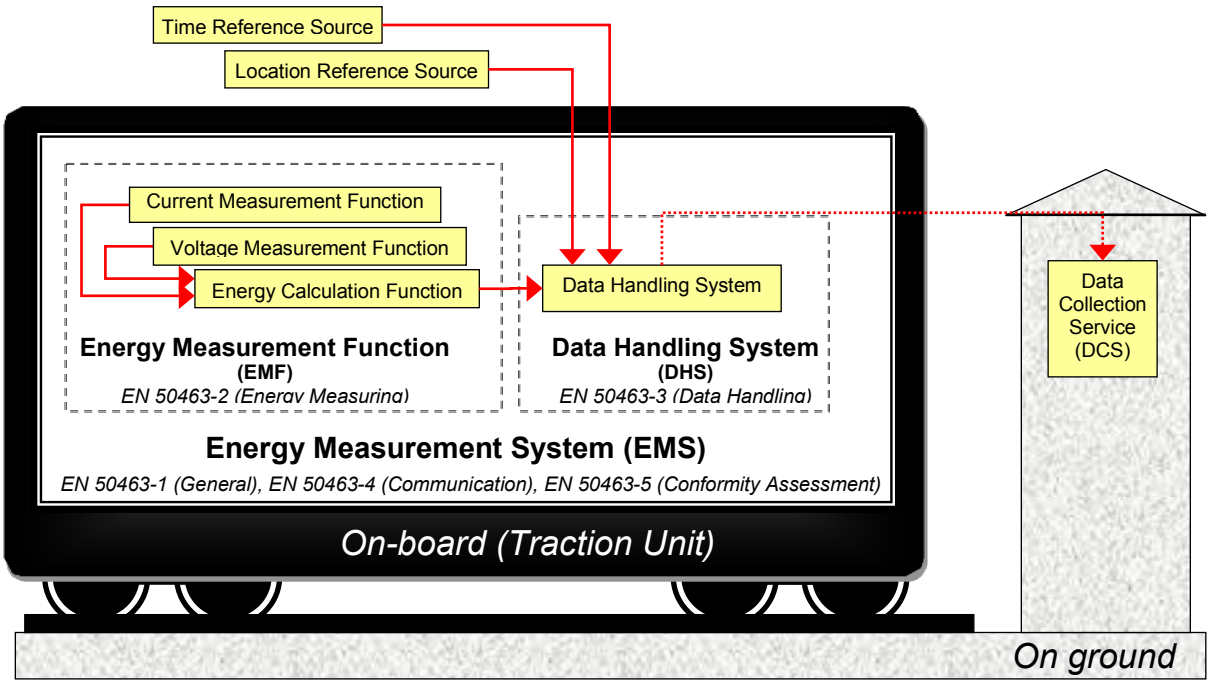

Figure 1 – EMS functional structure and dataflow diagram

1 Scope

This European Standard specifies the conformity assessment arrangements for newly manufactured EMS installed on a traction unit. This includes the integration conformity assessment and installation conformity assessment. In addition, this document also specifies the conformity assessment procedures for device and ancillary component replacement (e.g. due to damage in service), and periodic check to verify the EMS conformity assessment remains valid.

This European Standard does not include elements related to conformity assessment aspects other than design review and testing provisions for the products, processes or services specified. Consequently, this part does not delete, change or interpret the general requirements for conformity assessment procedures and vocabulary detailed in EN/ISO/IEC 17000.

This European Standard does not cover the conformity assessment schemes that, according to CENELEC Internal Regulations, are the responsibility of ISO policy committee “Committee on conformity assessment” (ISO/CASCO).

2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

EN 50155:2007, *Railway applications — Electronic equipment used on rolling stock*

EN 50463-1:2012, *Railway applications — Energy measurement on board trains — Part 1: General*

EN 50463-2:2012, *Railway applications — Energy measurement on board trains — Part 2: Energy measuring*

EN 50463-3:2012, *Railway applications — Energy measurement on board trains — Part 3: Data handling*

EN 50463-4:2012, *Railway applications — Energy measurement on board trains — Part 4: Communication*

3 Terms, definitions and abbreviations

3.1 Terms and definitions

For the purposes of document, the terms and definitions given in EN 50463-1:2012 and the following apply.

3.1.1
conformity assessment
demonstration that specified requirements are fulfilled

3.1.2
Conformity Assessment File
CAF
folder holding all documentation produced during conformity assessment

3.1.3
EMS installation
installation of an EMS equipment type into a traction unit of a specified type

3.1.4
EMS integration
integration of devices, interconnections and ancillary components, forming a specific EMS equipment type

3.1.5
Implementation Under Assessment
IUA
specific EMS equipment type used throughout the conformity assessment

3.1.6
installer
entity responsible for the installation of an EMS equipment type into a traction unit type

3.1.7
integrator
entity responsible for integrating devices, interconnections and ancillary components, forming an EMS equipment type

3.1.8
periodic re-verification
activities carried out periodically to check that the conformity assessment of an in-service EMS remains valid

Note 1 to entry: These re-verification activities are solely for the purpose stated, consequently other in-service activities such as maintenance and fault finding etc are not covered by this term.

3.1.9
protective interface
interface which permits intended data to be exchanged, and prevents unintended data being exchanged

3.1.10
traction unit type
specific design of traction unit, produced by one manufacturer and having similar properties, the same uniform construction of parts determining these properties and the same functional components.

Note 1 to entry: The type is represented by the traction unit sample provided for the EMS installation type tests.

3.2 Abbreviations

For the purposes of this part, the following abbreviations apply.

All the abbreviations are listed in alphabetical order.

CAF	Conformity Assessment File
CEBD	Compiled Energy Billing Data
CPID	Consumption Point ID
DCS	Data Collection Service
DHS	Data Handling System
ECF	Energy Calculation Function
EMF	Energy Measurement Function
EMS	Energy Measurement System
IDRR	Integration Design Review Report
IRTR	Installation Routine Test Report
ITTR	Integration Type Test Report
IUA	Implementation Under Assessment
RVR	Re-verification Report

SRDR Installation Design Review Report

STTR Installation Type Test Report

4 Conformity assessment approach

4.1 General

This clause specifies the structure and methodology for the conformity assessment. The procedures, design review requirements, testing requirements, and conformity assessment documentation requirements are specified in Clause 5. Completion of devices level conformity assessment is a pre-requisite to carry out EMS conformity assessment. The conformity assessment is undertaken in the following key stages:

1. device level;

2. EMS level;

3. EMS re-verification and device / ancillary component replacement.

Stage 1 is mandatory for newly manufactured devices and is covered by EN 50463-2, EN 50463-3 and EN 50463-4. Stages 2, 3 are mandatory for every EMS in accordance with the scope as specified in Clause 1. The conformity assessment, undertaken during stages 2 and 3, deals primarily with system level requirements, and it does not replicate the detail in stage 1.

4.2 Situation of applicability

The EMS conformity assessment described in this part applies in case of:

- EMS integration,
- EMS installation,
- EMS periodic re-verification,
- EMS device / ancillary component replacement.

4.3 General Methodology

The conformity assessment is undertaken using the following methods:

a) device design review;

b) device type test;

c) device routine test;

d) EMS integration design review;

e) EMS integration type test

f) EMS installation design review;

g) EMS installation type test;

h) EMS installation routine test.

Furthermore the following methods are covering the re-verification and replacement:

i) EMS periodic re-verification;

j) EMS device / ancillary component replacement.

Methods a) to c), are used at device level and the conformity assessment arrangements are covered by EN 50463-2, EN 50463-3 and EN 50463-4. Methods d) to j) apply at EMS system level and are described in this part of the EN 50463 series of standards.

Each method described generates evidence of conformity. Methods d) to h) are listed in logical order. They may be undertaken in the same testing environment.

Completing the integration methods d) and e) allows the possibility of using this integration conformity assessment in conjunction with multiple installation conformity assessment's. This approach can be employed when the same EMS equipment type is to be used on several different traction unit types, using multiple installation conformity assessment's to deal with the installation issues only.

The Figures 2 illustrates the methods of conformity assessment arrangements.

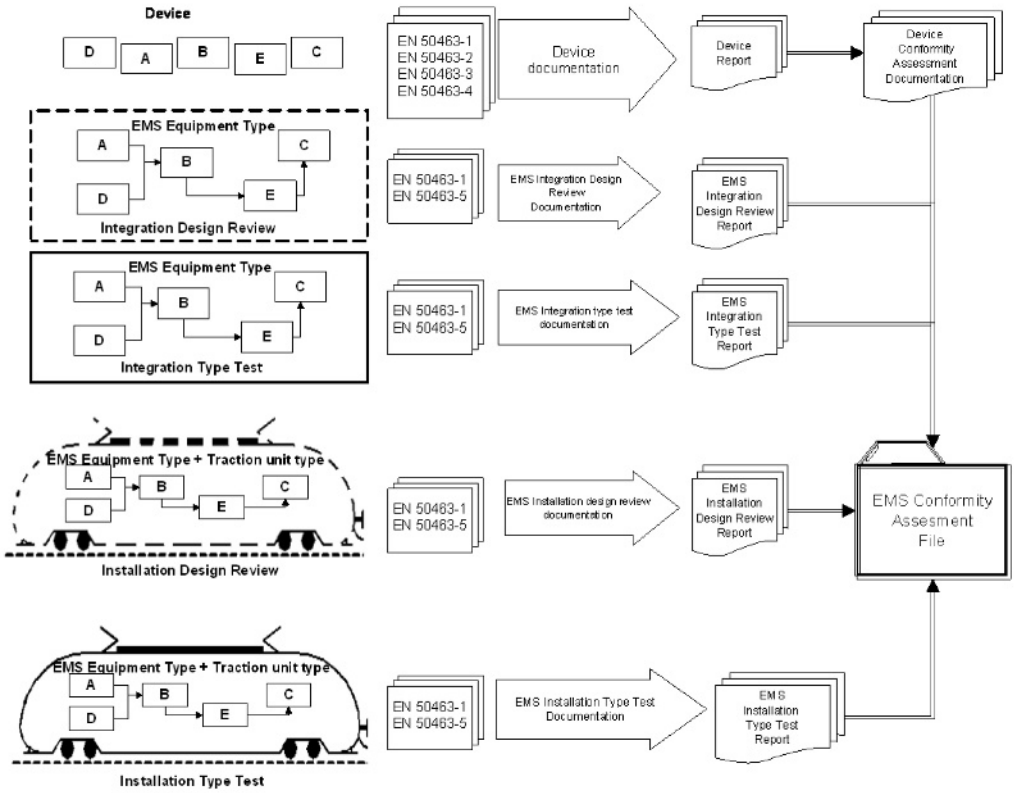

Figure 2 - Methods of conformity assessment

4.4 EMS Specific Methodology

Methods d) to j) apply at EMS system level, the methods i) and j) address re-verification and device component replacement. Methods are listed in logical order. They may be undertaken in the same testing environment.

4.4.1 EMS integration design review

The integration design review demonstrates that all the devices of a specific equipment type used to form an EMS are able to be brought together correctly in accordance with an EMS design, and when integrated together provides the intended functionality in accordance with this series of standards.

4.4.2 EMS integration type test

The integration type test demonstrates that all the devices of a specific equipment type forming the EMS when integrated together are functioning as intended in accordance with this series of standards.

4.4.3 EMS installation design review

The installation design review assesses the compatibility between an EMS of a specific equipment type and a traction unit type, so that its functionality is maintained when installed on board.

4.4.4 EMS installation type test

The installation type test demonstrates that the integrated EMS of a specific equipment type, when installed on board on a specimen representative of the traction unit type, is functioning as intended in accordance with this series of standards.

4.4.5 EMS installation routine test

The installation routine test demonstrates that the type tested EMS functionality is assured for each installation on traction units of the same type.

4.4.6 EMS periodic re-verification

The EMS periodic re-verification activities are used to ensure the conformity assessment of an in-service EMS remains valid, where necessary confirm metrological properties, so that the EMS can continue to be used.

4.4.7 Replacement of devices and ancillary components

If a device / ancillary component of an in-service EMS is replaced, the substitution procedure ensures that the EMS conformity assessment remains valid and the EMS can continue to be used.

5 Conformity assessment procedures

5.1 General

Before undertaking conformity assessment in accordance with Clause 5, all devices forming an EMS of a specific equipment type shall have passed the appropriate device level conformity assessment in accordance with EN 50463-2, EN 50463-3, and EN 50463-4.

NOTE If design changes are made to traction unit no conformity assessment of EMS is required unless the changes affect the EMS.

5.2 EMS integration design review

5.2.1 EMS integration design review documentation

In order to carry out the EMS integration design review, the following documentation shall be provided by the integrator for each designated EMS equipment type:

a) list of the devices / ancillary components integrated into the equipment type and relevant setting information;

b) mapping of the function(s) and sub-function(s) specified in EN 50463-1, EN 50463-2, EN 50463-3 and EN 50463-4 to the devices integrated into the equipment type;

c) EMS integration design;

d) device level conformity assessment documentation for each device integrated into the EMS.

5.2.2 EMS integration design review assessment

Using the documentation listed above and, if necessary, any further information provided by agreement with the integrator, the EMS integration design review is carried out and shall give the evidence that:

a) all mandatory EMS functionality is provided;

b) the integration assures compatibility between the devices forming the EMS and, if applicable, any aspects of the EMS and other systems;

c) the conformity assessment done at device level remains valid;

d) EMS level requirements, which are to be verified by design review, are met;

e) interfaces between devices that are exchanging CEBD and CEBD-related data are protective interfaces;

f) interface(s) for service and testing are available and protective;

g) the software dealing with CEBD and CEBD-related data provides the security means requested by EN 50463-1, 4.3.4;

h) installation constraints necessary to ensure safety and performance are clearly identified and documented;

i) the required indicators are available according to EN 50463-1, 4.3.7.3.

All requirements that cannot be verified by design review shall be listed and verified by the EMS integration type test. This information shall be produced and used as an input document during the execution of the conformity assessment type test methods to ensure all requirements are addressed. For example, knowledge of the insulation arrangements at EMS level and the testing done at device level are necessary to ensure the correct test requirements are adequate at EMS conformity assessment stage.

5.2.3 Integration Design Review Report (IDRR)

In case of a positive fulfilment of all the requirements of 5.2, the the Integration Design Review Report shall be issued and shall be included in the conformity assessment file.

5.3 EMS integration type test

This clause contains the test requirements for integration type testing carried out as part of the conformity assessment during the integration phase.

5.3.1 Integration type test procedure

The integrator shall produce a type test procedure for the EMS equipment type which describes how the integration type tests are to be performed. The procedure shall also take into account requirements not verified during integration design review and shall clearly identify the service, operational and test interfaces including arrangements for applying test signals and monitoring performance. This document can be produced in collaboration with the test authority.

This integration type test procedure is specific to the integration design detailing how the devices are integrated and interconnected to form a specific EMS equipment type.

The integration type test procedure shall be included in the Conformity Assessment File.

5.3.2 Integration type tests

As a minimum the following test activities shall be performed.

5.3.2.1 Visual inspection

Check that the IUA matches the EMS equipment type and carry out a visual inspection in accordance with EN 50155:2007, 12.2.1.

5.3.2.2 Power-up

Energize the power supply to the EMS and check the EMS reaches operational status within the time limit of 60 s.

5.3.2.3 Power-down

Energise the IUA such that it simulates the EMS operating with all external equipment behaving as intended before and during the power down test.

Power down the EMS, and check

1) the EMS has successfully powered down,

2) any data being recorded during power down is successfully processed and stored.

NOTE Simulated operation can use signals introduced at the sensor outputs as an alternative to injecting signals directly into the EMS input.

5.3.2.4 Traction supply system change

Simulate one traction supply system change and check that the requirements stated in EN 50463-1, 4.2.4.1 are fulfilled.

NOTE The assessment procedure can use simulated output from the sensors as an alternative to injecting signals directly into the EMS input.

5.3.2.5 EMS Data flow test

Simulate input to the EMS and check the correlation between the input signals applied and the data stored in the DHS, also ensure that the CEBD is stored correctly.

NOTE 1 The assessment procedure can use simulated output from the sensors as an alternative to injecting signals directly into the EMS input.

Simulate data export from the DHS via the local service port and compare the data stored in the DHS with data exported and ensure the data exported is identical to that held in the DHS.

Simulate data export from the DHS to the DCS and compare the data stored in the DHS with the data stored in the DCS and ensure the two data sets are identical.

NOTE 2 The DCS can be the actual or a simulated one.

5.3.3 Integration Type Test Report (ITTR)

In case of a positive fulfilment of all the requirements of 5.3 the assessor shall issue the Integration Type Test Report. The Integration Type Test Report shall be included in the Conformity Assessment File.

5.4 EMS installation design review

5.4.1 EMS installation design review documentation

In order to carry out the EMS installation design review, the following documentation shall be provided by the installer for each designated EMS equipment type and its installation into the specific traction unit type.

Documentation related to the EMS equipment type:

a) list of the devices and ancillary components integrated into the EMS equipment type and relevant setting information;

b) mapping of the function(s) and sub-function(s) specified in EN 50463-1, EN 50463-2, EN 50463-3 and EN 50463-4 to the devices integrated into the equipment type;

c) EMS integration design;

d) device level conformity assessment documentation for each device integrated into the EMS.

NOTE Mapping from the Integration Design Review can be used.

Documentation related to installation of the EMS equipment type into the traction unit type:

e) installation specification taking into account device environmental, safety, performance and installation constraints;

f) installation design and settings according installation specification;

g) installation procedures;

h) installation requirements and constraints to ensure compatibility between the traction unit type and the EMS equipment type;

i) Installation design measures to provide protection from non-authorised access.

5.4.2 EMS installation design review assessment

Using the documentation listed above and, if necessary, any further information provided by agreement with the installer, the EMS installation design review is carried out and shall verify that the EMS equipment type and the traction unit type are compatible (e.g. mechanical, temperature, electromagnetic compatibility, clearance, rated insulation, safety, and maximum cable impedance / lengths etc.).

5.4.2.1 Insulation

Check the insulation level of the EMS equipment type installed on board the design traction unit type is in accordance with the requirements of EN 50463-1, 4.3.8.1. Documentation shall be provided which details the insulation level and overvoltage class and shows that the requirements are fulfilled.

Check that any installation constraints and requirements, which are relevant to the installation testing activities, are clearly documented.

5.4.2.2 Enclosure

If additional enclosures are provided as part of the installation design, check that they are in accordance with EN 50463-1, 4.3.7.2.

5.4.2.3 Protection from non-authorised access

Check that all requests for access to data, software or system parameters relevant for the production and storage of CEBD go through an authorisation procedure before access is granted and that all requests and all changes are logged.

Check that any measures for protection from non-authorised access necessary at the installation routine test are clearly documented.

The review should focus on checking (i) the adequacy of the protection afforded by device level measures when integrated into the IUA, and (ii) the adequacy of any additional measures (implemented by the integrator or the installer).

5.4.2.4 General safety requirements

Check that the EMS design meets the safety requirements in accordance with EN 50463-1, 4.2.5.4.

Check that any measures related to the general safety requirements, which are relevant to the installation testing activities, are clearly documented.

5.4.3 Installation Design Review Report (SDRR)

In case of a positive fulfilment of all the requirements of 5.4 the assessor shall issue an Installation Design Review Report. The Installation Design Review Report shall be included in the Conformity Assessment File.

5.5 EMS Installation type test

The EMS installation type test shall be performed on an EMS of a specific equipment type installed on a traction unit of a specific type.

5.5.1 Installation procedure

The installer shall produce all the documentations necessary to install the EMS equipment type within the specimen of the traction unit type in accordance with the installation design taking into account the limitations imposed by the traction unit (e.g. significant sources of electrical and electromagnetic disturbance, cable routing constraints etc). The installation procedure shall be included in the Conformity Assessment File.

5.5.2 Installation type test procedure

The installer shall produce a type test procedure for the EMS equipment type which describes how the type tests are to be performed. The procedure shall also take into account requirements not verified during installation design review and shall clearly identify the service, operational and test interfaces including arrangements for applying test signals and monitoring performance. This document can be produced in collaboration with the test authority. The installation type test procedure shall be included in the Conformity Assessment File.

5.5.3 Installation type tests

As a minimum the following test activities shall be performed.

5.5.3.1 Visual inspection

Check that the IUA matches the EMS equipment type and traction unit type specified into the installation design. Carry out a visual inspection in accordance with EN 50155:2007, 12.2.1.

Check if EMS equipment type has been installed in accordance with the installation design and installation procedures.

Check if the status of the required indicators can be ascertained.

5.5.3.2 EMS data flow test

Provide a known input quantity to the EMS, check that the data is stored correctly in the DHS and is consistent with the input signals applied. Simulate data export from the DHS via the local service port and compare the data stored in the DHS with data exported and ensure the data exported is identical to that held in the DHS.

5.5.3.3 Data transfer through all communication channels

Simulate data export from the DHS to the DCS and compare the data stored in the DHS with the data stored in the DCS.

During data transfer test check:

a) the connecting procedure successfully establishes communication between the DHS and DCS via all intended channels;

b) data can be exchanged between DHS and DCS;

c) the two data sets are identical;

d) DCS can retrieve data from DHS;

e) the connecting procedure successfully establishes communication between the EMS and any intended ground station via all intended channels.

NOTE The ground station and the DCS can be the actual or a simulated one.

5.5.4 Installation Type Test Report (STTR)

In case of a positive fulfilment of all the requirements of 5.5, an Installation Type Test Report shall be issued which clearly identifies:

a) the EMS equipment type,

b) specimen of traction unit type.

The Installation Type Test Report shall be included in the Conformity Assessment File.

5.6 EMS installation routine test

The EMS installation routine tests shall be executed on each EMS when installed on a specific traction unit type reported in the Conformity Assessment File.

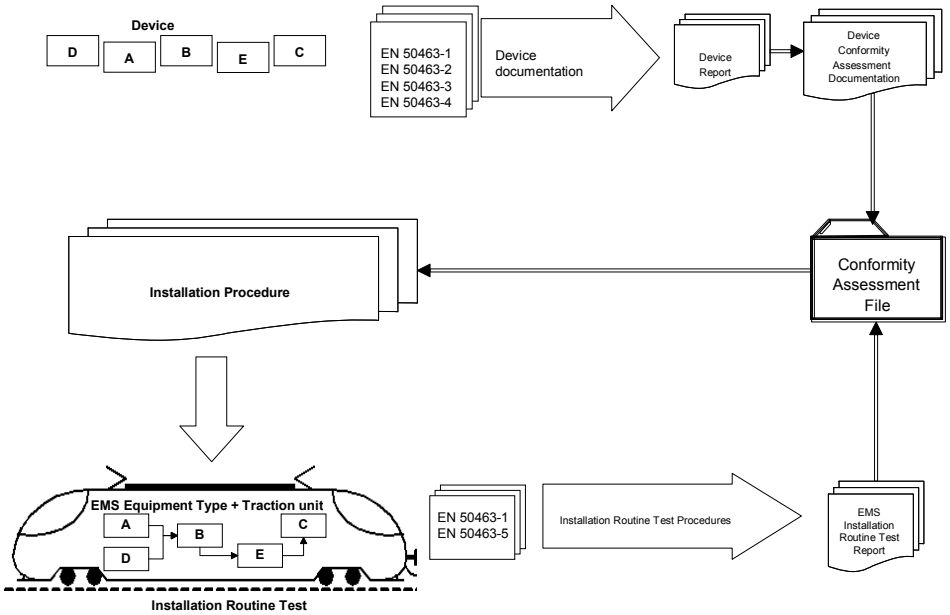

Figure 3 - Overview of EMS installation routine test process

5.6.1 Installation routine test procedure

The installer shall produce a routine test procedure for the EMS equipment type which describes how the routine tests are to be performed.

The installation routine test procedure forms part of a Conformity Assessment File.

5.6.2 Routine tests

The following test activities shall be performed.

5.6.2.1 Visual inspection

Check that the EMS equipment type and traction unit are in accordance with the type reported in the Conformity Assessment File. Carry out a visual inspection in accordance with EN 50155:2007, 12.2.1.

Check if EMS equipment type has been installed in accordance with the installation design and installation procedures.

5.6.2.2 Power-up

Energise the power supply to the EMS and check the EMS reaches operational status in accordance with EN 50463-1, 4.2.2.1.

5.6.2.3 Power-down

Energise the IUA with all external equipment. Initiate an intentional power down of the power supply used by the EMS and check the EMS has successfully powered down in accordance with EN 50463-1, 4.2.2.2.

5.6.2.4 Traction supply system change

Apply the input signals to the EMS, check that traction supply system change is detected in accordance with EN 50463-1, 4.2.4.1.

NOTE If the same device is used for different traction supply systems, it is sufficient to perform one traction supply system change.

5.6.2.5 Insulation

Check that any installation constraints and requirements related to the insulation of the EMS, which were identified during the installation design review stage, are complied with.

5.6.2.6 Protection from non-authorised access

Check that the measures for protection from non-authorised access identified during the installation design review are implemented and functioning.

5.6.2.7 Indicator

Check if the required indicators are functioning correctly.

5.6.2.8 General safety requirements

Check that any measures regarding the general safety requirements identified during the installation design review are correctly implemented.

5.6.2.9 EMS data flow test

Provide signals to each of the EMS inputs and check that all devices are functioning and CEBD is stored in the DHS.

Check that CEBD in the DHS is available through the local service port.

Initiate data export from the DHS to a DCS and check transfer is successful.

Check that the DHS is accessible from the DCS.

NOTE The DCS can be the actual or a simulated one.

5.6.3 Installation Routine Test Report (IRTR)

In case of a positive fulfilment of all the test of 5.6 the installer shall produce an Installation Routine Test Report confirming that the installed EMS on board the specified traction unit is ready to be brought into use.

NOTE The EMS can carry a fictitious CPID until the EMS is commissioned into commercial use. The process of assigning the correct CPID to a specific EMS and all other activities needed to bring it in commercial use, are out of the scope of this standard.

5.7 Periodic re-verification

5.7.1 Procedure

To ensure that an in-service EMS can remain in operation it shall undergo a periodic re-verification according to the procedure applicable to the EMS equipment type and traction unit type.

The periodic re-verification procedure shall include:

a) the maximum periodicity (before undertaking the periodic re-verification);

b) visual inspection of documentation to ensure parts of the EMF with time limited conformity assessment are still within their validity period;

c) checks in accordance with the requirements previously agreed with the relevant authority (see EN 50463-2, 4.2.6), any part of the EMF which requires periodic testing to confirm metrological properties;

d) checks to ensure that the installed EMS equipment type on the traction unit matches with the EMS equipment type detailed in the Conformity Assessment File and in the Installation Type Test Report;

e) if physical protection (e.g. sealing) is used, check to ensure this is in place.

NOTE EN 50463-2, Annex D, gives an informative overview of an approach to periodic re-verification of the metrological aspects of an EMF.

5.7.2 Re-verification Report (RVR)

In case of successful re-verification, a Re-verification Report shall be issued. The Re-verification Report shall state the maximum validity period until the next re-verification takes place.

5.8 Replacement of devices and ancillary components

5.8.1 General

When a device or ancillary components forming part of an EMS are replaced, the assessment described within this clause shall be executed to ensure that the EMS continues to be in conformance with the requirements of EN 50463. The replacement shall be performed according to the installation procedure specified in 5.5.1.

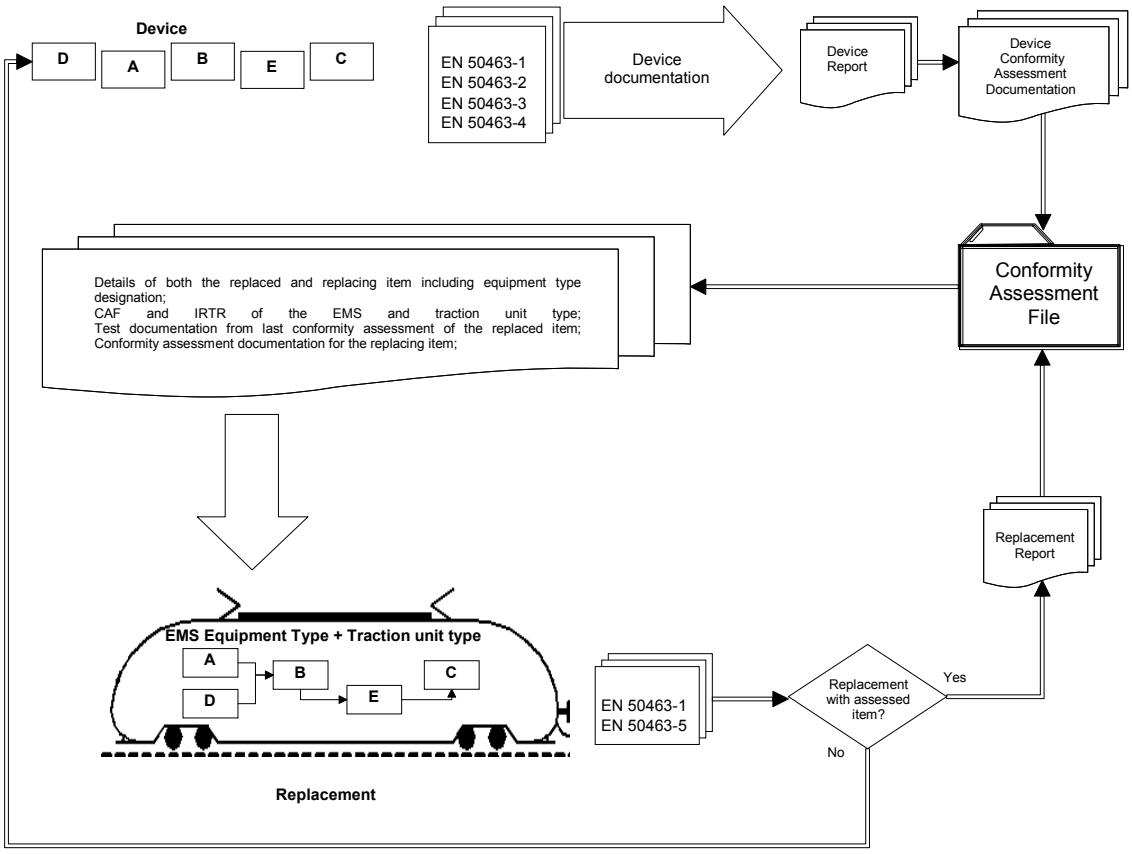

Figure 4 - Replacement of devices and ancillary components

Replacement activities shall only refer to the replacement of device and ancillary components listed in the EMS integration and installation design.

The item to be replaced is hereafter referred to as the “old item”, and the item to be installed is the “new item”.

5.8.2 Documentation

To be able to perform the conformity assessment, documentation having the following information shall be made available:

- details of both the new and old item including equipment type designation;
- Conformity Assessment File and Installation Routine Test Report of the EMS and traction unit type;
- test documentation from last conformity assessment of the old item;
- conformity assessment documentation for the new item;

The documentation associated with the new item shall be placed in the EMS Conformity Assessment File. The previous conformity assessment shall also be retained in the Conformity Assessment File.

5.8.3 Item replacement conformity assessment

The conformity assessment to be undertaken in case of item replacement shall be undertaken on a non-regressive basis (only re-assessing those aspects which can influence the basic parameters). In order to establish the extent of the assessment, reference shall be made to the original conformity assessment type test and design review documentation.

When replacing an item, one of the following approaches shall be undertaken:

a) in case of replacement of old item with a new item of identical equipment type or an alternative equipment type previously assessed as part of the EMS conformity assessment, only device level routine testing on the new item and the relevant installation routine testing are necessary;

b) in case of replacement with a new item not previously assessed as part of the EMS conformity assessment, the new item shall pass the device level conformity assessment, and the EMS (including the new item) shall pass the EMS conformity assessment. The EMS conformity assessment shall be limited to the affected part, and undertaken on a non-regressive basis.

NOTE It is advisable for the initial EMS stage conformity assessment to also include alternative devices within the EMS equipment type to minimise future conformity assessment costs.

5.8.4 Software

Replacement/updates of software in an installed EMS require the new software to have passed device level conformity assessment relevant to the hosting device but limited to the affected part, and undertaken on a non-regressive basis.

5.8.5 Programmable parameters

Change of programmable parameters in an installed EMS requires an EMS installation routine test but limited to the affected part, and undertaken on a non-regressive basis.

5.8.6 Replacement report

If the assessment of replacement of an item, software or parameters gives a positive result, a report covering the replacement shall be issued. This report shall be placed in a Conformity Assessment File.

Annex ZZ
(informative)

Coverage of Essential Requirements of EU Directives

This European Standard has been prepared under a mandate given to CENELEC by the European Commission and the European Free Trade Association and within its scope the standard covers all relevant essential requirements as given in Annex III of the EU Directive 2008/57/EC.

Compliance with this standard provides one means of conformity with the specified essential requirements of the Directive(s) concerned.

WARNING: Other requirements and other EU Directives may be applicable to the products falling within the scope of this standard.

Bibliography

EN ISO/IEC 17000, *Conformity assessment — Vocabulary and general principles (ISO/IEC 17000)*

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