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64th GRE Session
Proposal for amendment of R 10.03
TRANS-WP29-GRE-2010-54e

Proposal from

France and Germany

Objectives

- The main objective is to extend the scope of the Regulation No. 10 to the charging mode of electric vehicle to all kinds of power train systems.

- On board chargers are electronic automotive components which can be incorporated in other electronic modules (and difficult to identify as a separate electronic component).

Distinction in between two vehicle modes:

- Original situation (with no charging on the power grid)
- EV or HV with the RESS in charging mode coupled to the power grid

Types of modifications

- Those concerning electric and hybrid vehicles in charging mode and in infrastructure communication mode

- Those dealing with other items, mainly editorial corrections and updated version of reference standards, etc…

Revision of ECE 10 – Electric and Hybrid vehicles

- To include emission and immunity requirements related to EV and HV in charging mode and in infrastructure communication mode:

1.3. It covers:

(a) requirements regarding the immunity to radiated and conducted disturbances for functions related to direct control of the vehicle, related to driver, passenger and other road users' protection, **and** related to disturbances, which would cause confusion to the driver or other road users, **related to vehicle data bus functionality, related to disturbances, which would affect vehicle statutory data;**

(b) requirements regarding the control of unwanted radiated and conducted emissions to protect the intended use of electrical or electronic equipment at own or adjacent vehicles or nearby, and the control of disturbances from accessories that may be retrofitted to the vehicle.

(c) additional requirements for vehicles providing coupling systems for charging the RESS regarding the control of emissions and immunity from this connection between vehicle and power grid.

New definition based on R 100 as amended

- Rechargeable Energy Storage System (RESS)

2.13 "RESS" means the rechargeable energy storage system that provides electric energy for electric propulsion of the vehicle.

- Coupling System for charging the vehicle

2.14 "Coupling system for charging the RESS" means the electrical circuit installed in the vehicle used for charging the RESS.

New definitions

2.7. "Electrical/electronic system" means (an) electrical and/or electronic device(s) or set(s) of devices together with any associated electrical connections which form part of a vehicle but which are not intended to be type approved separately from the vehicle. **Both RESS and Coupling system for charging the RESS are considered electrical / electronic systems.**

3.1.9. Vehicle type approval shall be applied for both RESS and Coupling system for charging the RESS as they are considered as electrical / electronic systems.

Revision of ECE 10 – Electric and Hybrid vehicles

- To consider only vehicle test as type-approval way for EV and HV in charging mode and in infrastructure communication mode (via « electrical/electronic system » classification).

- ESA type-approval way for EV and HV in charging mode and in infrastructure communication is difficult since on-board chargers are electronic automotive components which can be incorporated in other electronic modules and which cannot be easily identified in a vehicle as a separate electronic component

Revision of ECE 10 – Electric and Hybrid vehicles

- To update the definition of "immunity related functions" by adding an item for EV and HV in charging mode and in infrastructure communication mode.

2.12. "Immunity related functions" are:

(a) Functions related to the direct control of the vehicle:

(b) Functions related to driver, passenger and other road user protection.

(c) Functions which when disturbed cause confusion to the driver or other road users.

(d) Functions related to vehicle data bus functionality.

(e) Functions which when disturbed affect vehicle statutory

(f) Function related to the RESS in charging mode coupled to the power grid:

(i) by leading to unexpected vehicle motion.

Revision of ECE 10 – Electric and Hybrid vehicles

- To update the information that shal be provided by the vehicle manufacturer for EV and HV in charging mode and in infrastructure communication mode.

3.1.3. The vehicle manufacturer shall draw up a schedule describing all relevant vehicle electrical/electronic systems or ESAs, body styles, variations in body material, general wiring arrangements, engine variations, left-hand/right-hand drive versions and wheelbase versions. Relevant vehicle electrical/electronic systems or ESAs are those which may emit significant broadband or narrowband radiation and/or those which are involved in immunity related functions of the vehicle (see paragraph 2.12.) **and those which provide coupling systems for charging the RESS.**

Revision of ECE 10 – Electric and Hybrid vehicles

- To update the title of paragraph 6 which concerns all the vehicle configurations other than those in charging mode and in infrastructure communication mode. The technical content is unchanged from ECE 10.03.

6. SPECIFICATIONS **IN CONFIGURATIONS other than "RESS charging mode coupled to the power grid"**

Revision of ECE 10 – Electric and Hybrid vehicles

- To create a new specific paragraph 7 for EV and HV in charging mode and in infrastructure communication mode.

7. ADDITIONNAL SPECIFICATIONS IN THE CONFIGURATION "RESS charging mode coupled to the power grid".

7.1. General specifications

7.1.1. A vehicle and its electrical/electronic system (s) shall be so designed, constructed and fitted as to enable the vehicle, in configuration "RESS charging mode coupled to the power grid", to comply with the requirements of this Regulation.

7.1.2. A vehicle in configuration "RESS charging mode coupled to the power grid" shall be tested for radiated emissions, immunity to radiated disturbances, conducted emissions and immunity to conducted disturbances.

7.1.3. Before testing the Technical Service has to prepare a test plan in conjunction with the manufacturer, for the configuration "RESS charging mode coupled to the power grid" configuration which contains at least mode of operation, stimulated function (s), monitored function (s), pass/fail criterion (criteria) and intended emissions.

Revision of ECE 10 – Electric and Hybrid vehicles

- To take into consideration FOR EMISSION of EV and HV in charging mode both the generic emission standard IEC 61000-6-3 for residential environment and the automotive CISPR emission standards :
  - ✓CISPR 12 standard for broadband radiated emission (E-field outside the vehicle)
  - ✓IEC 61000-X-X standards for all other emission tests

This approach leads to :

- ✓5 new paragraphs concerning emission in new paragraphs: 7.2 concerning CISPR standards and 7.3 to 7.6 concerning IEC standards.
- ✓1 updated annex (4) concerning CISPR standards
- ✓4 new annexes (11 to 14) concerning IEC standards

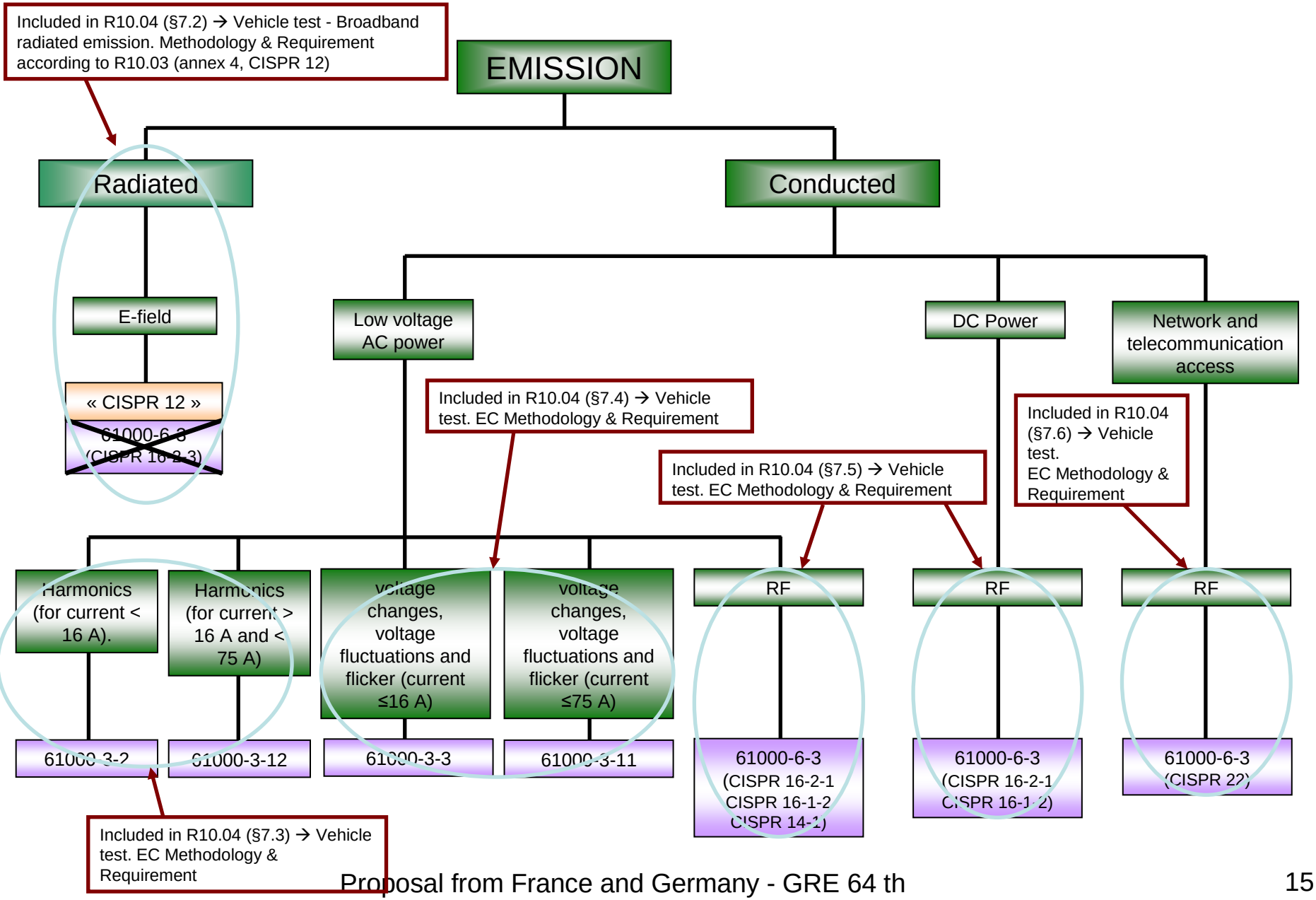
Revision of ECE 10 – Electric and Hybrid vehicles

- To take into consideration FOR IMMUNITY of EV and HV in charging mode both the generic immunity standard IEC 61000-6-2 for industrial environment and the automotive ISO/TC22/SC3/WG3 immunity standards :
  - ✓ ISO 11451-2 standard for radiated immunity to external sources
  - ✓ IEC 61000-4-X standards for all other immunity tests

This approach leads to :

- ✓ 3 new paragraphs concerning immunity in new paragraph 7: 7.7 concerning ISO/TC22/SC3/WG3 standards and 7.8 to 7.9 concerning IEC standards.
- ✓ 1 updated annex (6) concerning ISO/TC22/SC3/WG3 standards
- ✓ 2 new annexes (15 to 16) concerning IEC standards

Emission (coupling to power grid)



Immunity (coupling to power grid)