Standardisation in electromobility: future plans of international standardisation bodies for WPT

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Agenda

1. **CUNA** (Italian Body for Standardisation on Road Vehicles) presentation
   a. Industry Members
   b. List of technical commissions
   c. National contribution and National representatives

2. Standard related to electric vehicles especially for:
   a. Safety and Interoperability
   b. Standardization target
INDUSTRY MEMBERS

- FGA: passenger cars, powertrain and transmission (FCA)
- IVECO: Commercial vehicles & FPT Industrial (CNH Industrial)
- ANCMA: motorcycles and mopeds
- ANFIA: other road vehicles
- UNACOMA: agricultural machinery and tractors, Earth Moving Machinery
- UNACEA: Earth Moving Machinery
- UP: Fuels and lubricants
- Tyre manufacturers
- Component manufacturers
List of Technical Commissions

1. Vehicle ergonomics
2. Special outfitting and buses
3. Commercial vehicles outfitting and their trailers
4. Technical services
5. **Motorcycles and mopeds**
6. Fuels and lubricants
7. Agricultural, Forestry and gardening equipment
8. Earth Moving Machinery
9. Powertrain
10. Tyres, Rims and Valves
11. Passive Safety
12. **Electric, electronic and telematics on-board components**
13. Testing on vehicles and their components
14. **Electric, hybrid and fuel cell vehicles**
National Representative within ISO & CEN

ISO

Member countries

ITALY  FRANCE  GERMANY  USA  JAPAN

UNI/CUNA  AFNOR/BNA  DIN/VDA  ANSI/SAE  JISC/JSAE

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FABRIC Conference, Brussels
02/02/2015
Standards ISO, IEC, SAE, UL on wireless charging (1/3)

ISO 19363  Electrically propelled road vehicles – Magnetic field Power Transfer – Interoperability and Safety requirements
CUNA is leader of the Italian Delegation involved in the standardization activity related to Electrically Propelled Road Vehicles

1. The document ISO 19363 is at Working draft stage (WD); the completion is scheduled for 10-2016

2. Focus point having relation with FABRIC development:
   - Flux geometry/ coil geometry
   - Core specification
   - Operating frequency
   - Alignment tolerance requirements
   - Location of secondary device
   - Control loop of power transfer and response time of the loop
   - Parameters needed to be exchanged for interoperability
   - Resonant circuit topology, coupling factor and impedance (informative)
Standards ISO, IEC, SAE, UL on wireless charging (2/3)

ISO/IEC 15118 (scheduled for 10-2016) Road vehicle to grid communication interface
- Part 6: General information and use-case definition for wireless communication
- Part 7: Network and application protocol requirements for wireless communication
- Part 8: Physical layer and data link layer requirements for wireless communication

IEC 61980 Electric vehicle wireless power transfer (WPT) systems
- Part 1: General requirements
- Part 2: Specific requirements for communication EV and infrastructure
- Part 3: Specific requirements for the magnetic field power transfer systems
Standards ISO, IEC, SAE, UL on wireless charging (3/3)

**ISO 6469** Electrically propelled road vehicles -- Safety specifications
- Part 1 : On-board rechargeable energy storage system (RESS),
- Part 2 : Vehicle operational safety means and protection against failures
- Part 3 : Protection of persons against electric shock
- Part 4 : Post crash electrical safety (scheduled for 01-2016)

**SAE J2954** Wireless Charging of Electric and Plug-in Hybrid Vehicles
(Guideline scheduled for 06/2014)

**SAE J2836/6 J2847/6 J2931/6** Communication for inductive charging
(Guideline scheduled for 06/2014)

**SAE J1773** Electric Vehicle Inductively Coupled Charging (published as recommended practice)

**UL 2750** Wireless EV charging
FABRIC – Standards interactive information opportunities

- User need, concept and requirements for ICT solutions
- Review of existing ICT solutions and technical benchmarking
- Prototype of ICT modules for the on board information strategies
- Technical and user requirements
- Specification document
- Architecture definition
- Assessment of the technical feasibility of ICT and charging solutions
- FABRIC final use cases
- FABRIC test scenarios FABRIC needs

02/02/2015
FABRIC Conference, Brussels
FABRIC – Actions performed (I)

Ref. Deliverable D5.5.4.
Analysis of deployment scenarios, standardization and harmonization

Analysis of consistency of FABRIC development to Standards ISO 19363 "Electrically propelled vehicles – Magnetic field wireless power transfer – Safety and interoperability requirements" (mainly considered from the vehicle side), scheduled for definition by October 2016 and proposed for comments by November 19th, 2015.

The analysis was conducted on the last edition of the standard draft, which presently covers the wireless power transfer “for stationary applications”, considered mainly from the vehicle side.

For this document (scheduled for definition by October 2016), comments have been prepared, with considerations related to FABRIC technology developments with respect to the static applications, but also in view of a specific standard provisions for dynamic WPT.
Comments to ISO/PDPAS 19363 regarding Interoperability

- **General**
  Capability of the supply device and the electric vehicle device being able to transfer power wirelessly in a safe and efficient manner (as in IEC 61980-1)
- **Location of the secondary device**
  Recommended to be located in the central position of the vehicle, to foster the interoperability between different charging modes (e.g. dynamic)
- **Alignment tolerance requirements**
  To be defined, with consideration to static and dynamic applications indications can be proposed according to the progress of the study and the development of the technology, also with consideration of the MF-WPT system and the possible use of driver assist system for the approach to the charging source.
- **Pairing**
  Suggest to delete “unique” dedicated primary device, to open the way to other modes of user identification
- **System frequency**
  The System frequency range should be defined taking into consideration the present developments of the technology and the possible interoperability with other operational modes (dynamic, stationary)
<table>
<thead>
<tr>
<th>MB/NC</th>
<th>Line number (e.g. 17)</th>
<th>Clause/Subclause (e.g. 3.1)</th>
<th>Paragraph/ Figure/Table (e.g. Table 1)</th>
<th>Type of comment</th>
<th>Comments</th>
<th>Proposed change</th>
<th>Observations of the secretariat</th>
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<tbody>
<tr>
<td>IT1</td>
<td>68</td>
<td>6.1</td>
<td>ge</td>
<td></td>
<td>Completion of the definition of Interoperability, consistently with the definition given in IEC 61980-1</td>
<td>The sentence is proposed to be read: Interoperability refers to the capability of the supply device and the electric vehicle device being able to transfer power wirelessly in a safe and efficient manner, based on compliance with the regarding specification</td>
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<tr>
<td>IT2</td>
<td>142</td>
<td>6.4.1</td>
<td>ed</td>
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<td>Table 4, instead of table 7</td>
<td>Substitute table 7 with table 4</td>
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<tr>
<td>IT3</td>
<td>147</td>
<td>6.4.1</td>
<td>Table 4</td>
<td>te</td>
<td>Alignment tolerance requirement (tbd) should be defined in accordance to the study and development of the technology for static and dynamic application, in consideration to the interoperability and the possible driver assist mechanism by the EV for alignment</td>
<td>Presently no change</td>
<td></td>
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<tr>
<td>IT4</td>
<td>170</td>
<td>6.5.2</td>
<td>Table 5</td>
<td>te</td>
<td>The system frequency range and the nominal frequency should be defined taking into consideration the present developments of the technology and the possible interoperability with other operational modes (dynamic, stationary)</td>
<td>Presently no change</td>
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<td>IT5</td>
<td>259</td>
<td>7.6</td>
<td>te</td>
<td></td>
<td>Correlation with unique dedicated primary device could constitute a limitation of the modes of user identification for certain use cases</td>
<td>Delete unique</td>
<td></td>
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</table>
Actions planned

Propose a NWI for a Standard dedicated to WPT in dynamic mode, harmonized with ISO, IEC and SAE, with main focus on:

- Interoperability, at the general mobility system level, which should concern the Wireless Power Transfer capability between vehicle and infrastructure with dynamic mode and with static wireless infrastructure facilities.
- EMF and EMC aspects and related safety protective system
- Vehicle system safety, in relation with Standard ISO 6469-1,-2,-3,-4
- Homogenize vehicle layout in order to improve every aspect related to safety and rescue activities in case of accident
- Bi-directional energy transfer G2V and V2G
- Harmonization with drive assisting systems for supporting charging point approach and positioning
COP 21st : Final Agreement

• 195 Countries will signed on April this agreement

• Main target for the year 2030 are:

  ✓ CO2 production limit at 40 billion t
    (if we continue with the current trend would arrive to produce 55 billion t)

  ✓ Earth temperature increase limit at maximum 2°
    (General commitment to limit at 1,5 °)
COP 21st : Financial Opportunities

“BIG OIL”, to day, moves investments for
~ 30.000 billion $

Achieve COP 21st Target it means to reduce dramatically coal and oil consumption

In this contest, according to the main financial opinion leader, the investments on “Big Oil” will be reduced by ~ 8.000 b$ and its will move towards renewable energy and related application........
CONCLUSION

This new context is very favorable for the “world of zero emission vehicle”

Electric cars will play a major role for decreasing pollution and improving the world living standards
Thank you!

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