SAE J2954 OVERVIEW AND SCOPE PRESENTATION (12-2014)

KEITH WILSON
PROJECT MANAGER, TECHNICAL PROGRAMS
GLOBAL GROUND VEHICLE STANDARDS

JESSE SCHNEIDER (BMW)
TASKFORCE CHAIR J2954
WIRELESS POWER TRANSFER
OVERVIEW: SAE J2954

• SAE Hybrid / EV Committee Structure & J2954 Task Force Structure
• Standardization Philosophy: Technical Information Report / Standard
• SAE J2954 Scope
• SAE J2954 Content
  ➢ Safety Limits
  ➢ Performance Targets
  ➢ Testing
  ➢ Interoperability
• Goals
SAE EV, Hybrid & Fuel Cell Vehicle Standards Development

SAE EV / Hybrid Vehicle Steering Committee

- Started – 2005
- Current Committee Membership
  - >1100 Individual Participants
  - >500 Companies
    - OEM’s
    - Suppliers
    - Government
    - Academia
- 12 EV / Hybrid Vehicle Subcommittees
- 7 Fuel Cell Standards Subcommittees
SAE J2954 Taskforce Structure

J2954 OEM Advisory Team
12 OEMs

J2954 Taskforce Chair
(Jesse Schneider)

Communication & Alignment Methods*
- M. Klerer - Qualcomm
- K. Sealy – Witricity

Safety, Performance, Robustness Testing & Validation
- M. Abdul-Hak – Daimler, Jeff White- Denso

Magnetic Field Interoperability
Co-Chairs:
- I-Teerlinck –Toyota
- G. Covic – University of Auckland

UL 2750 / SAE J2954 Verification Testing
- J.Bablo –UL
- J. Sirotta –Witricity

Bus Charging
SAE J2954-2 (series with J2954)
- A. Safaee, Bombardier
- R. Burns OLEV Technologies

WPT
- EMC /EMF
- R. Boyer-Delphi
- R. Kautz-Ford
- P. Anderson
- R. Sutton-TDK-rf

Liaisons:
- ISO/IEC : Jon Sirotta (Witricity)/ Ivo Teerlinck (Toyota)
- SAE EMC Committee: Richard Kautz (Ford)
- CISPR 11: Rich Boyer (Delphi)
- ANSI: Kautz (Ford) / Sutton

* In Coordination with SAE Hybrid Communications & DSRC Committees
SAE J2954 SCOPE

An overview of an industry/government collaborative effort for the development of SAE J2954 which will establish minimum performance, interoperability and safety criteria for wireless charging of EVs / PHEVs.

The document scope includes residential and parking garage (A), parking lot (B) and roadway charging (C) locations and Wireless Power Transfer (WPT) charging levels 1,2 & 3.
Vehicle Wireless Charging Standards Overview
Overlap SAE J2954, SAE J2836/6 UL 2750

SAE J2836/6: Use Cases and Communications
SAE J2847/6: WPT Communication PHEV and the Utility Grid
SAE J2931/6: Digital Communication for WPT for PHEV

SAE J2954: Wireless Charging and Alignment

UL 2750: Verification of Wireless Charging Base Safety

MOU Between SAE and UL

SAE J2954 Status 2014-5
J2954 Testing Scope

EM Field

Performance

Durability

Safety

Safety Limits

- Positions / Orientations
- Optimal Performance
- Performance -5%, -10%

ICNIRP + Pacemaker Limits

- SAE J1211
- ISO 16750
- USCAR 37

Safety

- Object Detection
- Temperature due to induced current / voltage
J2954 Safety Limits and Testing

TOPICS FOR J2954

Safety

- Obstacle Detection (Organic, Inorganic)
- Magnetic Field ICNIRP
- Communication of Charging Battery SOC Levels, Issues with Temperature, Charging Rate
- Temperature Development Test
- Electric Shock
Effects on Other Objects

Foil Paper
Debris, Water, Pie Plate
Pop Can
Other Electronics
PEPS, AM Radio
Extension Cord

Safety Limits
<table>
<thead>
<tr>
<th>Classification</th>
<th>WPT Power Class</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>WPT1 L.D.</td>
</tr>
<tr>
<td>Maximum WPT Power</td>
<td>3.7 kW</td>
</tr>
<tr>
<td>Efficiency Rating Target* (80-90%*)</td>
<td>&gt;90%</td>
</tr>
<tr>
<td></td>
<td>WPT2 L.D. Fast Charge</td>
</tr>
<tr>
<td></td>
<td>7.7 kW</td>
</tr>
<tr>
<td></td>
<td>&gt;90%</td>
</tr>
<tr>
<td></td>
<td>WPT3</td>
</tr>
<tr>
<td></td>
<td>22 kW</td>
</tr>
<tr>
<td></td>
<td>&gt;90%</td>
</tr>
</tbody>
</table>

* Under Team Review
“85kHz” Frequency Band Decision for SAE J2954:

Start of Band (kHz) | End of Band (kHz)
---|---
81.38 | 90.00

Potential Frequencies for WCS

- Potentially Available
SAE J2954 Goals in 2015

• Publish TIR J2954 LD (Technical Information Report) Guideline for purposes of first phase of small volume vehicle testing
  – Determine baseline performance, safety and interoperability specification.
  – Collect data from across the industry and from the Team, National Labs, and International Standards groups

• Bring FCC, FDA, AAMI, & DOE together with industry to standardize WPT

• Setup a Plan and Start Harmonization with Worldwide Standardization

• Start H.D. Charging TIR J2954-2
THANK YOU

QUESTIONS?:

J2954 LIGHT DUTY WPT
JESSE.SCHNEIDER@WEB.DE

J2954/2 HEAVY DUTY WPT
ROGERVBX@GMAIL.COM