EVPC-2-11

Informal document No. **GRSP-46-27**
(46th GRSP, 8 - 11 December 2009,
agenda item 14)

ELSA adhoc N°xx

Informal adhoc ELSA Working Group

Geneva, December 9th, 2009

Proposal from France based on

- Informal document GRSP n°46-04

- ECE/TRANS/WP.29/GRSP/2009/16

Proposal for an R 94 amendment

- Objectives:
  - To have material to homologate electric vehicle regarding crash test requirements
  - To use R 94 as a basis for performing the crash test requirements - no modification of the existing R 94, only introduction of new prescriptions to take into account EV/HEV.
  - To extend to R 95 in a second step
  - **Note:**

    According to ELSA TOR paragraph 6, Japanese Technical Standard (Attachment 111 - protection of passengers from high voltage after collision of electrical vehicles and electrical hybrid vehicles) is one of the basis for the activity of ad-hoc meeting

CONTENT

- No change for the scope of R 94
- New definitions
- EV vehicle type and vehicle information
- Passenger compartment and new other definitions

  (Taken from the proposal **ECE/TRANS/WP.29/GRSP/2009/16** submitted for R 100 amendment)
- Test conditions
- Spillage /cells locations
- Electrical safety requirements
- Method of measurements

EV vehicle type and information

- ***[The place of the RESS].***

- ***General description of the RESS type and [location] and the electric powertrain (e.g. hybrid, electric)***

Passenger compartment definition

- ***[2.7.1 For vehicles with electric powertrain, passenger compartment means the space for occupant accommodation, bounded by the roof, floor, side walls, doors, outside glazing and front bulkhead and the plane of the rear compartment bulkhead or the plane of the rear-seat back support, or rear gate, as well as by the barriers and enclosures provided for protecting from direct contact with high voltage live parts]***

New definitions

- Add new definitions taken from the current amendment proposal for the R 100 : 2.16 to 2.31.

- ***2.16. "<u>RESS</u>" means rechargeable energy storage system that provides the electric energy for propulsion***.

General requirements

- *Tests conditions*
- *Spillage requirements from RESS*
- *Cells and RESS locations and retention*
- *Electrical safety requirements*

Test conditions

- *1.4.4. Electric powertrain adjustments*
- *[1.4.4.1.The high voltage system shall be energized.]*
- *1.4.4.2. The RESS shall be at a state of charge which allows the normal operation of the power train recommended by the manufacturer*

Spillage

- Not more than [5.0] litres of liquid except coolant from RESS shall spill outside the passenger compartment, and no visible trace of liquid except coolant from RESS shall spill into the passenger compartment, within 30 minutes after a barrier impact test. Compliance may be demonstrated by test or analysis.
- If the spilled liquid cannot clearly be identified as coolant, the entire amount of liquid should be considered.

Cells and RESS locations

- 5.2.8.2. RESS located inside the passenger compartment must remain in the installed location and RESS components shall remain inside RESS. No part of any RESS that is located outside the passenger compartment shall enter the passenger compartment during the test procedures, as determined by visual inspection.

Electrical safety requirements after crash test

- ***Isolation resistance****: if not IPXXB :500 Ohm/V for AC and 100 Ohm/V for DC circuit (in between chassis and high voltage bus/portion*
- ***residual voltage (s)*** *lower than the high voltages values (if > 60 V and ≤ 1500 V in DC or > 30 V and ≤ 1000 V in AC* (rms).
- ***Residual energy*** *on high voltage bus less than 0,2 j.*
- ***Physical Barrier protection*** *for live parts against direct contact and resistance between the electrical chassis and all exposed conductive parts shall be less than 0.1 ohm against indirect contact.*

Annexes – test procedures

- **Test setup and equipment**
- **Bus voltage**
- **Isolation resistance measurement method (from R 100)**
- **Electrical Energy**
- **Physical Barrier**