EVS-05-05e

Application to fuel cell electric vehicles (FCEV)

(OICA contribution to action item #3 from 4th meeting of EVS informal working group)

**Justification**

1. In general, hydrogen fuel cell electric vehicles utilise “high voltage”, i.e. more than 60V DC or more than 30V AC (rms), for its electric power train and therefore appropriate measures against electrical shock need to be taken.

2. The risk of high voltage and the principle to protect against electrical shock for fuel cell electric vehicles are the same as those applied for battery electric vehicles and hybrid electric vehicles.

3. GTR No.13, global technical regulation on hydrogen and fuel cell vehicles, includes electrical safety requirements. For the development of such requirements of the GTR No.13, the outcome of ELSA informal working group (including ELSA-EVPC) was used as the basis and therefore the electrical safety requirements in GTR No.13 are, to a large extent, similar to those of UN Regulation No.100 for in-use electrical safety and UN Regulations No.12, No.94 and No.95 for post-crash electrical safety.

4. As a result of comparison of the electrical safety related requirements between GTR No.13 and EVS-04-07 (see attachment), only three significant differences have been identified;

(a) Installation of isolation monitoring system on fuel cell electric vehicles.   
(paragraph 5.3.1.2.4.1. of GTR No.13 vs. paragraph 5.1.1.2.4.3. of EVS-04-07.)

(b) Applicability of physical protection option for post-crash electrical safety.

(c) Applicability of low energy option for post-crash electrical safety.

5. The EVS informal working group is expected to address anyway these issues and come to global consensus which will then be adopted in EVS-GTR.

6. In addition, although fuel cell electric vehicles are likely to be equipped with REESS, GTR No.13 does not provide any specific technical requirements for the safety of the REESS. Therefore, current GTR No.13 could not be considered as to cover whole safety aspects specific to fuel cell electric vehicles.

**Recommendation**

7. With respect to the electrical safety of hydrogen fuel cell vehicles, the followings are recommended;

(a) The EVS-GTR should also apply to hydrogen fuel cell vehicles, which include electric powertrain operating with high voltage (i.e. fuel cell electric vehicles).

(b) Once EVS-GTR is established, GTR No.13 should be amended to remove all electrical safety requirements by providing a reference to EVS-GTR. This will prevent inconsistencies between the two GTRs and simplify the maintenance of the requirements in the future.

Attachment: Comparison of electrical safety requirements between GTR No.13 and EVS-GTR draft