

CLEPA contribution about the GRSP-ELSA-3-3 document: Preliminary OICA proposal on post crash electrical safety – GM Contribution:

**OPEN QUOTE:**

[2.1 Electrolyte spillage from propulsion batteries

Not more than 5.0 liters of electrolyte from propulsion batteries shall spill outside the passenger compartment, and no visible trace of electrolyte shall spill into the passenger compartment. Spillage is measured from the time the vehicle ceases motion after a barrier impact test until 30 minutes thereafter, and throughout any static rollover after a barrier impact test.]

Revision / Comment on 2.1:

The spillage of harmful chemicals should not be higher than the national or international allowed amount and the concentration of these chemicals in case of an accident should not be higher than allowed.

[2.3 Electrical Safety

Within 5 seconds of the vehicle coming to rest after each crash test, electrical safety shall be provided as follows:

(a) For AC high-voltage systems, at least one of the following criteria shall be met:

- (1) Electrical isolation between any high-voltage source and the vehicle chassis electricity-conducting structure greater than or equal to [500] ohms/nominal volt; or
- (2) Voltage of the bus equal to or less than 30 VAC; or
- (3) Energy on the bus less than 0.2 Joules; or
- (4) The AC high-voltage bus is fully enclosed and isolated within a physical barrier that provides protection class IPXXB.

(b) For DC high-voltage systems, at least one of the following criteria shall be met:

- (1) Electrical isolation between any high-voltage source and the vehicle chassis electricity-conducting structure greater than or equal to [100] ohms/nominal volt; or
- (2) Voltage of the bus equal to or less than 60 VDC; or
- (3) Energy on the bus less than 0.2 Joules; or
- (4) The DC high-voltage bus is fully enclosed and isolated within a physical enclosure or barrier that provides protection class IPXXB.]

Revision / Comment on 2.3:

(a) For AC high-voltage systems, at least one of the following criteria shall be met under condition that the e- drive is not driven externally, e.g. by the moving of the vehicle:

- (1) Electrical isolation between any high-voltage source and the vehicle chassis electricity-conducting structure greater than or equal to [500] ohms/nominal volt; or
- (2) Voltage of the bus equal to or less than 30 VAC; or
- (3) Energy on the bus less than 0.2 Joules; or
- (4) The AC high-voltage bus is fully enclosed and isolated within a physical barrier that provides protection class IPXXB.

The reason for this is that for example a driven synchronous machine will produce a voltage!!! This cannot be avoided if the inverter is not working properly.

(b) For DC high-voltage systems, except the battery or other not dischargeable energy storage, at least one of the following criteria shall be met, in the case the electrical system stays functioning:

- (1) Electrical isolation between any high-voltage source and the vehicle chassis electricity-conducting structure greater than or equal to [100] ohms/nominal volt; or
- (2) Voltage of the bus equal to or less than 60 VDC; or
- (3) Energy on the bus less than 0.2 Joules; or
- (4) The DC high-voltage bus is fully enclosed and isolated within a physical enclosure or barrier that provides protection class IPXXB.]

If the electrical system is not functioning any more, e.g. in case of catastrophic crash with bursted vehicle, the single components and the system must be discharged within 30 s.

Reason: It is not possible to guarantee a fast discharge within 5 s if the total electrical system is bursted.

(c) For DC high-voltage storage systems the following criteria shall be met:

(1) The high voltage must be limited to the inside of the component.

**END QUOTE.**