

DRAFT (04.09.2008)

3rd Meeting: WP29 - GRSP – Informal WG on Electrical Safety (ELSA)

Bonn – German Department of Transportation

22. July 2008**24. July 2008**

Meeting Report

Mr. Kellermann as representative of the German Department of Transport welcomed the attendees of the third meeting of the informal working group on Electric Safety.

Mr. Kellermann then turned the meeting over to Chairman Mertens.

Agenda (see ELSA-3-1)

The agenda was adopted.

Meeting Minutes of the second Meeting (see ELSA-2-2)

Minutes of the second meeting were approved with a minor amendment. The date of the meeting in Bonn was updated to 22. – 24. July 2008.

Action Items

At the end of the report the necessary actions are listed in a table together with the organization/country responsible for it.

General

The aim of the informal group is to define the electrical safety provisions for vehicles “in-use” and “post-crash”. In a second step, the defined requirements have to be incorporated by experts into the GTR on hydrogen fuel cell vehicle (HFCV) and the ECE R100.

The requirements will be focused on the vehicle propulsion system.

Passenger cars and commercial vehicles are in the scope of the work of the informal group. The 1958 and 1998 Agreements have slightly different definitions of vehicle categories. Therefore the expert groups incorporating the requirements into the GTR and ECE R100 will need to define the scope using applicable vehicle classifications.

(A) Electrical Safety Provisions for Vehicles “in-use” (see ELSA-3-2Rev. 1e)

Provisions for “in-use” will define the requirements engineers should have in mind when designing a new vehicle.

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During the meeting the following decisions regarding the document were made:

1. Scope

The document will not stand alone. Therefore the title is changed from “scope” to “general”.

Furthermore it should clearly be stated that the requirements apply specifically to galvanically connected systems of the drive train of electric, hybrid and fuel cell vehicles. Other vehicle electrical systems (e.g., high-intensity-discharge headlamps) are excluded from the scope of this document.

2. Definitions

Definitions should be listed alphabetically to make it easier to find specific definitions.

OICA was asked to determine:

- whether “traction battery” (2-1) should be replaced by “rechargeable energy storage system (RESS)”.
- whether the existing definition of “exposed conductive part” (2-8) should be replaced by the new definition (2-8-1) in conjunction with the definition of “non-exposed conductive part” (2-8-2).

The US representative asked OICA to check whether it is possible to copy the requirements regarding protection degree IPXXB and IPXXD out of ISO 20653 directly into the “in-use” document (2-7).

The “electric circuit” (2-9) definition was amended as highlighted in ELSA-3-02-Rev.1e.

Regarding the 1.500 V D.C. and 1.000 V A.C. in the definition of “high voltage” (2-16) the US representative raised a study reservation. The background is that at the moment the US FMVSS 305 is undergoing a revision. In addition the justification for upper limits is that today no systems are known with a voltage above the mentioned limits. Therefore it may not be necessary to define requirements for systems that are unknown.

3. Requirements for Protection against Electrical Shock - not connected

With the changes in the first chapter it is no longer necessary to have separate chapters for “not connected” and “connected” systems. Therefore “not connected” in the headline can be deleted. Furthermore OICA has to check whether 3-1 “General” can be deleted.

The wording under 3-2 was improved (see ELSA-3-02-Rev.1e).

With the amendment of chapter 1 the requirements regarding the outlet under 3-2-3 can be deleted.

Since it is no longer necessary to differentiate between “connected” and “not connected”, it was decided to delete chapter 4. Therefore the requirements for a vehicle inlet moved from paragraph 4 to 3-2-4. OICA was asked to

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recommend improved wording for this section. With the new section 3-2-4 about “vehicle inlet” the chapter about “marking” will become new 3-2-5.

During the discussion about the vehicle inlet the question was raised whether the described logic (live parts became equal or below DC 60 V or below AC 30 V immediately) could become a general safety strategy. OICA volunteered to evaluate this possibility.

Under new 3-2-5 OICA has to check whether the sentences “Accessibility and removeability the symbol...” should be reworded.

Regarding the identification of high voltage wiring by orange color, OICA has to check whether there is a necessity to specify the color in more detail.

Under 3-3-2 it was agreed that welding is a safe connection (see ECE R100 § 5.1.2.2.3). But with the proposed wording “such means as” alternatives are also allowed. Absent further justification from OICA for alternatives, the highlighted text has to be deleted.

When a motor vehicle is connected to the external power supply, a connection to the ground is necessary. But OICA has to check whether this can/has to be specified in the sub-section of “in-use” (see 3-3-3).

Regarding insulation resistance (see 3-4) “vehicle chassis conducting structure” should be replaced by “electrical chassis” as defined under 2-11.

The representative of the US raised a study reservation regarding the thresholds of 100 ohms/volt and 500 ohms/volt.

A presentation made by the representatives of Japan indicated that the deterioration of the coolant may change the isolation resistance. OICA volunteered to come up with a proposal for the next meeting to solve the problem. The solution may be an onboard isolation resistance monitoring system or a function confirmation method of power supply shut-off at the time of electric leakage. Therefore paragraph 2-3 of the “Attached Sheet 1” and the “Attached Sheet 2” has to be re-considered.

4 Requirements for Protection against Electric Shock – connected

This paragraph can be deleted because of the agreed changes under paragraph 1.

5. Requirements for traction batteries / 6. Requirements for Functional Safety

During the discussion of the content of the paragraphs 5 and 6 it was not clear whether these kinds of requirements should be addressed by the informal group.

OICA should re-discuss the issue and come up with a justification what the group should do.

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(B) Electrical Safety Provisions for Vehicles “post-crash” (see ELSA-3-3Rev. 1e)

Since the Terms of Reference (ToR) request the informal group to define the electrical safety provisions for electric vehicles, hybrid vehicles and fuel cell vehicles, the missing categories were added in the first paragraph.

2.1 Electrolyte spillage from propulsion batteries / 2.2 Battery retention

See the decision made regarding paragraph 5. and 6. in the “in-use” document.

2.3 Electrical Safety

Regarding this paragraph the following questions were raised:

- What is the justification to measure within 5 seconds?
- How will combined AC and DC systems be checked?
- Are the measurements made under dry or wet conditions?

Furthermore the following remarks were made:

- The representative from the US raised concerns about the criteria (3). He asked for a justification why an energy level below 0.2 Joules causes no harm.
- The Japanese car manufacturers mentioned that criterion (4) has to be described in more detail.

OICA volunteered to provide a recommendation for improved wording for paragraph 2.3.

In paragraph 3.1 “battery/battery system” has to be replaced by “RESS (rechargeable energy storage system)”. Furthermore it has to be considered whether a definition of “normal operating voltage” is necessary.

Paragraph 3.2 should only require that the vehicle conditions are as described in the applicable crash standards. The representative from the US volunteered to develop a proposal.

In paragraph 4.1 “energy source/storage device(s)” has to be replaced by RESS. Furthermore 10 million ohms should be replaced by 10 mega ohm.

Paragraph 4.2 is linked to paragraph 2.3. Since it was agreed that paragraph 2.3 has to be revised, corresponding revisions should be adopted in paragraph 4.2.

In paragraph 4.4 the proposal shows 4 drawings which look very similar. OICA volunteered to check whether there is a possibility to merge them into one or two drawings.

In paragraph 4.5 it has to be mentioned that the product of V_b and I_e has to be integrated. Furthermore the last sentence is obsolete. It is not necessary to mention that when the energy is below 0.2 Joules the test is o.k.

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Date and venue of the next Meeting

The following was agreed by the group:

Date: 11. – 13. November 2008

Venue: “Palais des Nations” in Geneva

Miscellaneous

Terms of References (ToR) have been presented by Germany (GRSP-43-21) during the 43rd session of GRSP. The ToR were adopted by the group and will be on the agenda of WP.29 session in November 2008.

Thomas Goldbach, 21.08.2008

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Subsection “in-use”		
Where	What	Who
§ 2	Definitions should be listed alphabetically	Secretary of the group
§ 2	“traction battery” vs. RESS	OICA
§ 2	exposed conductive part	OICA
§ 2	IPXXB and IPXXD out of ISO 20653	OICA
§ 3-1	Can it be deleted?	OICA
New § 3-2-4	Improved wording	OICA
????	Possible new general safety strategy (live parts became equal or below DC 60 V or below AC 30 V immediately)	OICA
New § 3-2-5	Rewording of the sentence	OICA
	necessity to specify the color orange in more detail	OICA
§ 3-3-2	Justification for “such means as”	OICA
§ 3-3-3	Connection to the ground in the sub-section “in-use”?	OICA
???? 2-3 “Attached Sheet 1” “Attached Sheet 2”	Deterioration of the coolant may change the isolation resistance; proposal to solve the problem	OICA
§§ 5. & 6.	OICA should re-discuss the necessity of §§ 5. and 6. and come up with a justification what the group should do	OICA
Subsection “post-crash”		
Where	What	Who
§ 2.	Definitions should be listed alphabetically	Secretary of the group
§§ 2.1 & 2.2	See §§ 5. and 6. of subsection “in-use”	OICA
§ 2.3	Improved wording of § 2.3 “Electrical Safety”	OICA
§ 3.1	Definition of “normal operating voltage” necessary?	OICA
§ 3.2	Proposal for new wording	USA
§ 4.2	corresponding revisions of § 2.3 should be adopted in § 4.2	OICA
§ 4.4	Merge drawings if possible	OICA