

(DRAFT)

Report of the 2nd Meeting of the informal group on Electrical Vehicle Safety - Global Technical Regulation (EVS-GTR)

October 23 – 25, 2012

Venue:

Federal Ministry of Transport, Building and Urban Development
Robert-Schuman-Platz 1; 53175 Bonn, Germany

1. Welcome and practical arrangements:

Welcoming remarks were made by Mr. Friewald of the German Federal Ministry of Transport, Building and Urban Development

2. Approvals:

The agenda was discussed and approved.

The summary of the 1st Meeting of the informal group on Electrical Vehicle Safety - Global Technical Regulation (EVS-GTR) was explained and approved.

3. Report on UN activities:

Summaries of discussions regarding EVS-GTR at GRSP, WP.29 and EVE informal working group meetings were provided as listed below:

3.1 51st Session of GRSP in May 2012:

During this Session the ToR of the EVS-GTR informal group and the report of its 1st meeting were introduced to the delegates of GRSP. The experts of GRSP suggested a few edits which were incorporated into the report. These two documents were informally submitted and reported at the 157th Session of WP29 in June 2012.

3.2 157th Session of WP29 in June 2012:

During this Session the ToR of the EVS-GTR informal group and the report of 1st EVS informal group were introduced by US delegation and approved. Those documents will be officially submitted at the 158th session of WP.29 in November 2012.

3.3 2nd EVE meeting in September 2012:

The mandate of the EVE informal group was discussed and the ToR of this informal group was approved during the 2nd EVE meeting held in Baltimore, USA. The reference guide of EVE was also discussed and the priorities of potential research topics. Chinese representative, as vice chair of the EVE informal group, answered to the questions from EVS group

members, that EVE, as required, might develop possible GTR for EV environmental issues separated from EVS-GTR.

4. Update on ongoing and planned research and rulemaking activities:

Members of the EVS-GTR informal working group (IWG) continued to exchange information and provided status update on EV and battery research and testing activities. The summaries of the presentations are as follows:

4.1 China:

The representative of China, Ms. Chen Chunmei, presented an update of EV strategies, EV pilot project and standards in China. According to China's Energy Serving and New Energy Vehicle Industry Development Plan, China is planning to have 0.5 million EVs on the market by 2015, and 5 million EVs by 2020. China launched the EV pilot project from 2009 and around 19,000 energy-saving and new energy vehicles have been demonstrated by now. More than 60 EV and infrastructure standards in China have been established and published, focusing on the whole vehicle, key components, and infrastructure, etc., such as GB/T 18384 Safety Requirements for Electrical Vehicles, QC/T 743 Li-ion Battery for EV

OICA questioned whether the Chinese government intends to replace its standards with the GTR once it's established. China replied that it might revise its related standards on the basis of EVS-GTR. In addition, OICA requested China to identify those standards that are mandatory and those that are voluntary.

4.2 EU:

A representative of the Joint Research Center (JRC), Ms. Lois Brett, on behalf of EU, provided a presentation on the JRC organization, its role and its activities specific to EV battery research. The JRC is establishing facilities for:

- Battery cell performance testing,
- EV battery pack performance testing (up to 160 kW) and
- Battery cell abuse testing.

Using these facilities the JRC will perform pre-normative research in support of the deployment of batteries for vehicle traction. Scientific and technical support will be provided to policy makers concerning e-mobility and electrification of European transport. Furthermore JRC will also provide impartial and balanced scientific evidence to facilitate effective international and European standardization. A number of collaborations have been established including a Letter of Intent on Interoperability with Argonne National Laboratory and a Memorandum of Understanding with EUROBAT. Negotiations are ongoing to formalize agreements with other US DoE National Laboratories including NREL and SANDIA.

4.3 Korea:

The Korea provided a presentation on its fire testing including the localized/engulfing fire test on hydrogen fuel tank and REESS. In conclusion of the presentation Korea provided a proposal for the REESS fire test parameters. The IWG members will discuss this proposal further in future meeting.

4.4 US DOE:

The US Department of Energy representative, Mr. Lee Slezak, provided a presentation on its EV activities and some safety incidents regarding REESS. The presentation included details on the Advanced Vehicle Testing Activity (AVTA) program. The primary goal of AVTA is to

provide benchmark data for technology modeling, and research and development programs, by benchmarking and validating the performance of light-, medium-, and heavy-duty vehicles that feature advanced renewable energy technologies including EVs. The US DOE also works with first responders to establish the guideline on how to handle EVs and REESS in an emergency situation.

4.5 US DOT (NHTSA):

On behalf of the US, the Chairman provided an update on NHTSA REESS safety research program. Below is a summary of NHTSA's Li-Ion battery research main tasks and estimated completion dates:

- Failure Modes and Effects Analysis (FMEA): publication date anticipated after 1st quarter of calendar year 2013.
- Development of test procedures and performance requirements: SAE and Ford are leading 2 separate teams to conduct this task independently. The purpose of the task is to evaluate the FMEA and develop test procedures to mitigate the safety risks. This task is expected to be completed by October 2013.
- Standardized Battery Assessment and Field Discharge Procedure: NHTSA and Argonne National labs are working to identify, develop, and demonstrate methods for the safe management and handling of RESS in post-crash and non-operational environments. Estimated completion date for this task is August 2014.
- Analytical Tools Development Control System Performance Modeling: The purpose of this task is to define required operator warning indicators for RESS safety critical criteria. Research prognostic conditions and warnings for anticipated safety critical events. Volpe National Transportation Research Center is leading this effort to establish basic Fail-Safe Conditions, Diagnostic Codes and indicators, Data Recording/Storage (e.g., EDR), and Safety Prognostic Requirements. The completion date is expected by March 2014.

The German delegate questioned on how the research affects the timing of the development of the GTR. The US delegate expressed that NHTSA is conducting the research as timely as possible, and that the GTR requirements can be developed in the order of their maturity as research results become available.

5. Outline of GTR and draft proposal:

5.1 Outline of GTR:

In order to help developing a comprehensive GTR, the co-sponsors drafted an outline for the GTR. The Chairman presented the GTR draft outline on behalf of the co-sponsors. The IWG was informed that these items would be discussed and evaluated but would not necessarily be part of the GTR as some would, as such, be considered as a guidance or recommendations. The goal of the GTR is to establish safety provisions that would ensure the equivalent safety level for EVs as for conventional gasoline vehicles. Some relevant discussions are listed as follows:

Application:

The IWG agreed to exclude vehicle categories L6 and L7. Buses and trucks over 10,000 pounds are under consideration and to be discussed further at the next meeting.

General requirement:

The IWG agreed that to the extent possible the GTR safety requirements will be at the system level. Both inductive and conductive charging will be included when discussing the safety of charging safety requirement.

Charging inlet:

IWG agreed to include this item if there is a safety concern.

Water proof REESS or whole vehicle:

IWG agreed that the requirement may require further work to develop a test procedure. China suggested adding a requirement to ensure the vehicle is waterproof.

Generally, the requirements for REESS should be at the system level. However, when system level is not possible, the module or cell level may be considered.

The IWG confirm that the electrolyte spillage requirement will require further discussion and additional research since the electrolyte from Lithium based batteries evaporates during spillage.

Discussion:

The Germany delegate stressed the urgent needs for establishing a GTR since the mandate from WP.29 is the end of calendar year 2014. Current standards and existing knowledge should be used as much as possible and new areas can be developed during the next phase with proper research and analysis. OICA also stated that the industry needs a harmonized regulation to ensure global safety. The options for going forward with the single GTR or in multiple phases are open at this time.

China and Japan volunteer to reorganize, categorize and provide descriptions to the outline items. The IWG delegates are requested to provide comments as well as any research/analysis information.

5.2 OICA proposal:

OICA provided a detailed presentation of its proposal for GTR consideration. Some delegates from NHTSA also participated via Webex. The OICA proposal consisted of 2 main sections:

- Provisions for protection of electrical shock for in-use and post-crash.
- Provisions to ensure safety performance of REESS for in-use and post-crash.

The proposal contains similar requirements as in the UNECE-R100. While the proposal has room for improvement, it will serve well as a basis for future discussions. The IWG raised some questions and comments. Some relevant points are as follows:

- The proposal needs a rationale and justification section.
- The stringency of the performance limits and pass/fail criteria require further discussion and evaluation.
- Some additional definitions are needed.
- Clarification of the isolation resistance for post-crash.
- Mechanical integrity as well as other requirements need to be written in performance based, to the extent possible.
- Determination of volume of electrolyte spillage
- Influence of REESS SOC on test procedures outcome
- Identify origin/basis for Mechanical shock test data e.g. in Table 4
- Basis for times for fire resistance test duration

OICA will provide the rationale and justification as well as address the questions and comments raised by the IWG.

General comments from participants:

Canada: Canada needs more time to evaluate for detail technical requirement of OICA GTR.

Korea: Korea thinks some additional requirements regarding the fire resistance are necessary. Korea will provide its proposal at the next meeting.

China: China believes some requirements are missing and should be added to the OICA proposal. China proposes to discuss this proposal in the frame work of the GTR outline at the next meeting: The OICA proposal can be good way to meet the deadline from WP29. It is also harmonized with ECE R100.

Germany: Supports OICA proposal since it reflects the sound requirements of ECE R100 and results of the effort of the REESS IWG. Test procedures can be discussed further for heavier than M1 category.

EU/JRC: Agrees to use this proposal as a basis for future discussion.

US: OICA GTR draft is a good start. However, there is still room for improvement, specifically, the REESS section. The proposal will benefit from input of current research and analysis.

The Chairman and IWG delegates expressed their appreciation for OICA's continued support and cooperation.

6. Draft roadmap and timeline for establishing GTR:

Regarding the timeline for establishing the GTR, the Chairman, on behalf of the co-sponsors, presented 2 different options towards further development of the GTR. Both options, including their pros and cons, are described below. This outline served as a basis for the discussion at the meeting. The IWG had a lively discussion and came away with a good understanding of the options as well as the pros and cons. The IWG will continue to discuss the roadmap and timeline as a better understanding of specific technical issues in the GTR is obtained.

Option 1: Develop the GTR in 2 phases:

Approach:

- Phase (1) Proceed to draft and finalize a GTR using the OICA proposal, (a) Electric shock protection (b) REESS requirements, on items that have reached consensus.
- Phase (2) After GTR is established, amend the GTR to update and add additional REESS items that requires long research.

PROS: A partial GTR can be established within the mandate deadline from WP.29.

CONS: Questionable value of a partial GTR.

Option 2: Develop a complete and comprehensive GTR:

Approach: Start drafting the GTR using the OICA proposal – begin with the matured requirements e.g. Electric shock protection, continue to discuss REESS requirements while keeping them in square brackets in the GTR. Share research data as available and finalize GTR.

PROS: Comprehensive and complete GTR

CONS: Perhaps longer development time?

Japan supports Option 1, the two-phase approach using the OICA proposal with some additional requirements to complete phase 1 by 2014; and to amend the GTR with new requirements in phase 2.

Germany supports Option 1.

China expressed that it would support Option 2 and the GTR outline would ensure a complete GTR. The timing is not as important for China. Contributions from all IWG members to share data, knowledge and information are very important. China also expressed that the GTR outline, once completed, would help the IWG to make better decision to choose the option for GTR roadmap.

US expressed concerns with Option 1 as a partial GTR in phase (1) would not be enough for adoption by contracting parties. The US prefers Option 2 as it would provide a complete and comprehensive GTR.

Canada supports option 2.

Korea expressed that it has established its regulations since 2009 and will continue to support the GTR effort. It does not have a preference for the option at this time.

EU mentioned that a single robust GTR is the ideal, however at present it is unclear how much more research is needed and how long this is expected to take to be able to come to such a robust regulation. An inventory of available research data is required in order to evaluate if it is reasonable to wait to publish GTR in a single phase or whether it is best to adopt a 2 phase approach.

OICA representative expressed that it is very important to have a harmonized and timely GTR. OICA members support Option 1, since Option 2 may require too much time.

CLEPA expressed its support for Option 1.

The Chairman expressed that for both options, the necessary effort at the beginning would be the same. Therefore, at this time, we can start our work regardless of which option is agreed. The IWG will have more opportunity at the next meeting to discuss and decide on the roadmap going forward.

7. Any other business:

None

8. Actions items and future meetings:

8.1 Action items:

- Chairman will provide a progress report to the WP29 in November 2012 and GRSP in December 2012.
- GTR Application: should GTR include busses and heavy trucks - members of working group members to consult with their experts on buses and heavy trucks and discuss further at the next meeting.

- The members of working group should look at the safety aspect of the inductive charging - by the next meeting.
- The members of working group will provide questions regarding OICA proposal to the secretary - by end of January 2013.
- OICA to prepare rationale and justification for the OICA proposal and address questions- by the next meeting.
- Japan and China will work on the GTR outline; reorganizing the items and providing descriptions. Co-sponsors will distribute to the members of working group by January 2013.
- The IWG Secretary will post all meeting documents, presentations and the action item list on the UNECE/GRSP website and inform all members.
- Contracting parties and industry will provide a list of regulations and standards regarding electric vehicles and REESS to the secretary including nomenclature and title - by November 2012
- The Secretary will distribute the meeting report and action item list which explains the remaining tasks, open issues, and/or responsive person etc, and attendance list as annex.

8.2 Future meetings:

The third EVS meeting is scheduled for April 16th thru 18th, 2013 in Tokyo, Japan.

The fourth EVS meeting is tentatively scheduled for October 2013 in China.