

Suggestions for the development of RESS Regulation

1. Background

During the preparatory meetings in JASIC, JASIC committee members examined the recent development of related regulations and industrial standards, and considered that the complete development of the RESS Regulation would take much longer time than expected. Therefore, JASIC proposes to define more precise priority of the technical requirements as well as the timeline before entering the detailed discussion of the requirements.

2. Current situation of related regulations and industrial standards

- (a) Most of the industrial standards related to RESS safety is only applicable to Li-Ion rechargeable batteries and the discussion for other types of RESS has not been sufficiently made so far.
- (b) There is no existing ECE Regulation that can sufficiently cover necessary requirements of RESS, and therefore amendment of several Regulations will be necessary. The approval of vehicle system will be anyway necessary even if the component type approval scheme can be established.
- (c) With respect to Li-Ion rechargeable batteries, the UN test manual section 38.3 is, in practice, implemented as mandatory technical requirements and applied under the self-certification scheme, and has been contributed to ensure the reliability and safety of the RESS to certain extent.
- (d) Most of the relevant industrial standards (ISO, IEC, SAE, etc.) are still before the official publication and the validation of the test procedure might not be enough due to the lack of experience.

3. Recommended approach

- At first, the group should focus on Li-Ion rechargeable batteries to examine the technical requirement and then examine applicability to other types of RESS considering the difference of the chemical characteristics.
- The priority should be given to ensure the safety as a vehicle rather than an RESS component. The group should start the discussion on requirements that are anyway necessary for the vehicle approval and then examine necessity and effectiveness of component tests. It will be more appropriate to establish a new ECE regulation in order to facilitate the component approval scheme, while the necessary requirements for a vehicle system can be added to relevant Regulations.
- Since the UN38.3 is already in place, the requirements not covered by the UN38.3 should also be given a priority.
- Before the adoption of technical requirements, the extensive assessment and testing should be conducted at the several technical services and manufacturers, in order to validate whether such requirements are reasonable, effective and practicable. The time frame of the group should accommodate the necessary period for such validations. If certain requirement is not sufficiently validated, such a requirement should be dropped from the 1st step requirements and further developed at a later step.

4. Priority of the technical requirement for the group's discussion

(1) Items not sufficiently covered by UN38.3

- ◆ 3.7 Overcharge protection
- ◆ 3.8 Over-discharge protection
- ◆ 3.9 Over temperature (loss of thermal control)
- ◆ 3.6 Short circuit (external of cell, but inside of the battery enclosure)
- ◆ 3.4 Mechanical shock
- ◆ 3.5 Fire resistance
- ◆ 3.13 Short circuit (cell internal)*

(2) Items reasonably covered by UN38.3

- ◆ 3.1 Vibration
- ◆ 3.2 Thermal shock cycling (dew condensation)

(3) Items of which critical phenomena can be assessed with other requirements

- ◆ 3.3 Humidity/Dew (External short circuit)
- ◆ 3.12 Over-current charge (Overcharge protection, Over-temperature)

(4) Items covered by existing ECE Regulations

- ◆ 3.10 Protection against direct contact (R12, 94, 95, 100)
- ◆ 3.11 Gaseous emissions (R100)

5. Possible agenda for the later phase

- ◆ Extension of scope to other categories of vehicles
- ◆ Worldwide harmonization
- ◆ Review of the requirement adopted as the 1st step based on the practical experience
- ◆ Adequate test procedure for cell internal short circuit
- ◆ Consideration for the RESS with new chemistry.

* According to the working document for the 38th session of ECOSOC Sub-Committee of Experts on the Transport of Dangerous Goods (TDG), the test procedure simulating cell internal short circuit is not available yet. (ref. para. 5 (b) of ST/SG/AC.10/C.3/2010/81.)