

Committee of Experts on the Transport of Dangerous Goods and on the Globally Harmonized System of Classification and Labelling of Chemicals

Sub-Committee of Experts on the Transport of Dangerous Goods

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Electric storage systems

Transport of used or damaged lithium batteries

Transmitted by the Expert from Germany

Introduction

1 Document ST/SG/AC.10/C.3/2010/7 raises the question what are the appropriate transport conditions for the transport for used or damaged lithium batteries. Further consultations with affected industry led to a more detailed definition of possible need of actions. Three main issues have been identified:

- Transport of damaged lithium batteries while developing process;
- Transport of used lithium batteries at the end of their life time; and
- Transport of lithium batteries with indication of damage.

Transport of damaged lithium batteries while developing process

2 When prototypes of lithium cells or batteries are transported for testing they are exempted from the testing requirements in Chapter 38.3 of the Manual of Test and Criteria if packed as specified in SP 310 (outer packaging meeting PG I , inner packaging for each cell and battery and cushioning material). According to the German interpretation of the wording of SP 310 “transported for testing” this covers all necessary testing (not only the testing according to the Manual of Test and Criteria), it covers the transport to the testing site as well as the transport back, irrespective if the destination is a disposal site or a laboratory for further examinations of the batteries. At this stage, it is very likely that the batteries are damaged by the performed tests: prototypes may fail the tests according to Chapter 38.3 of the Manual of Test and Criteria or other tests, e.g. crash tests, cause necessarily the damage of a battery. Dependent on the character of the extent of the damage, further measures may be necessary to ensure the safety of transport. Possible measures may be e.g. additional absorbing material in the inner packaging, securing in such a way that they cannot slip or leak, cooling or a period of storage before transport. The determination of the concrete measures can be left to the responsibility of the industry as the measures may be influenced by the knowledge which kind of tests have been carried out and how the battery reacted. This is not a typical transport operation. Nevertheless,

SP 310 should be amended by adding a requirement, saying that additional measures have to be taken, if the batteries have been damaged by the tests and the requirements described under (a) and (b) are not sufficient to ensure their safe transport.

Transport of used lithium batteries at the end of their life time

3 Used lithium batteries at the end of their life time can be treated in the same way as new batteries if there are no indications that they are damaged. They still comply with SP 230.

Transport of lithium batteries with indication of damage

4 The UN Model Regulations currently do not differentiate between new and used/damaged lithium batteries. But damaged lithium batteries are forbidden for air transport. Special provision A 154 of ICAO TI reads as follows “Lithium batteries, identified by the manufacturer as being defective for safety reasons, or that have been damaged, that have the potential of producing a dangerous evolution of heat, fire or short circuit are forbidden for transport (e.g. those being returned to the manufacturer for safety reasons).” Such batteries can not be prohibited for all modes of transport, on the spot disposal is usually not possible. Nevertheless the existing provisions for the transport of lithium batteries may be not appropriate for damaged batteries. A new packing instruction for damaged lithium batteries should be included in the UN Model Regulations. This new packing instruction should take into consideration the following aspects:

- Only approved packagings should be allowed, also for larger batteries of a gross mass of 12 kg or more. If the batteries are too large for approved packagings which have to comply with the limits of 6.1.1.1 (net mass not more than 400 kg and capacity not more than 450l) only packagings which are approved by the competent authority for these batteries may be used.
- The packagings shall conform to the packing group [I] performance level.
- The cells or batteries are packed in a tight closable inner packaging made from non-flammable material, the inner packaging has to be resistant against possible leaking liquids.
- Free spaces in the inner packaging are filled completely with non-combustible, non-conductive, absorbing material.
- The cells or batteries are packed and fixed to prevent short-circuits.
- [Used] cells or batteries have to be stored at least for [5] days prior to transport.
- Alternative measures should be allowed only if they

5 The new packing instruction should apply to new damaged batteries (e.g. lithium batteries that are subject to recall campaigns) as well as to used damaged batteries. A special provision, assigned to UN 3090, UN 3091, UN 3480 and UN 3481, should be included in the Model Regulations to define the scope of the new packing instruction. The content of this special provision should be as follows:

- Used lithium batteries at the end of their life time may be packed according to P 903.

- Used lithium batteries with indication of damage that may have impact on the safety during transport have to comply with the new packing instruction.
6. Lithium batteries with indication of damage are in particular:
- Batteries identified by the manufacturer as being defective for safety reasons,
 - Batteries with damaged or considerably deformed cases,
 - Batteries with leakage or venting or
 - Batteries that are not diagnostic-capable.

Proposal

7. The Sub-Committee is invited to discuss the possible amendments regarding the transport of damaged lithium batteries. If the Sub-Committee agrees to the concept described above – amendment of SP 310 and insertion of new packing instruction for damaged lithium batteries combined with a new SP defining damaged batteries – Germany is willing to submit a new proposal along those lines.
