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

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Electric storage systems:
Hazard-based system for classification of lithium batteries

Hazard-based system for classification of lithium batteries: report of lunchtime working groups

Transmitted by the experts from Belgium and France and by the Advanced Rechargeable and Lithium Batteries Association (RECHARGE) on behalf of the informal working group

I. Introduction

1. A revised version of document ST/SG/AC.10/C.3/2024/13 was presented in informal document INF.26. During the presentation described in informal document INF.70, it was suggested to organize a lunchtime working group to continue the discussion. As a result two lunchtime working groups on Thursday, 27 and Friday 28 June 2024, were held. This document summarizes these discussion.

II. Summary

2. Five concepts were discussed with regards to the new classification:

- Optional and on voluntary basis
- Granularity
- Packaging conditions
- State of Charge (SoC)
- Sodium ion batteries

3. On the new classification being proposed as optional and on voluntary basis many participants mentioned that it should be better called a “default” system: cells/batteries that are not tested would default to the most restrictive provisions linked to the most conservative division. Some felt the most conservative provisions may be appropriate for all batteries under the current system.

4. The group was divided on whether the new classification needed to be in addition to the current system or whether it should replace the current system over a transition period or whether it should replace the current system without transition period. When the new classification does not provide clear exceptions for small batteries (Special Provision 188) it was agreed that this may have a major impact to industry today. This should be analyzed.

5. On the granularity there was consensus that it would only provide benefit if there would also be a difference in corresponding packaging and transport conditions for the divisions. When different divisions would allow the same packaging and transport conditions no granularity is needed between those divisions. Modal bodies may have additional restrictions or requirements, and they may benefit from the provided granularity.

6. For classification and identification the schemes of explosives and organic peroxides were mentioned as possible analogy systems. The group agreed with the granularity that the new tests for classification could provide.

7. With regards to the packaging conditions it was mentioned that the current system used for existing entries may need to be reviewed. It may be that packing instruction P903 is not restrictive enough. Some felt the classification system must give manufacturers incentives to perform the testing and in addition should restrict manufacturers if they do not. Therefore, more restrictive conditions for "non-tested" batteries or batteries in an "unknown state for transport" should be considered.

8. The group generally agreed that if you can guarantee the batteries will be shipped at a lower state of charge (SoC), the cells/batteries may be tested at a lower SoC. Some felt the test at 100 per cent SoC should be the "default". Some mentioned that testing on 100 per cent SoC defined the intrinsic hazards, testing on lower SoC would define the transport conditions. Some felt it may be appropriate to set the test condition at lower SoC always on 30 per cent SoC. Others felt manufacturers should get the option to choose the SoC for the additional test, as 30 per cent SoC would adversely impact battery designs that are safe at 100 per cent SoC.

9. Once a battery has left the manufacturer, there will be no control so it was suggested to have some way of communicating/guaranteeing the SoC downstream in the transport chain. Manufacturers have the ability to manage the SoC, but downline shippers may not. Further, it was mentioned it is important to make the determination of the division and thus the hazards at the worst case situation. The group agreed this would be at 100 per cent SoC.

10. On sodium ion batteries the group agreed to include sodium ion batteries in the new classification. Some suggested that the system could even be used for other types of batteries and other battery designs with reactive components. It was noted that sodium ion batteries can be shipped in an open voltage condition so that there is 0 voltage at the terminals. Therefore, other conditions that apply to sodium ion batteries might need to be addressed at some point.