



## **DANGEROUS GOODS PANEL (DGP) WORKING GROUP MEETING (DGP-WG/22)**

**Montréal, 21 to 25 November 2022**

- Agenda Item 2: Managing air-specific safety risks and identifying anomalies (REC-A-DGS-2025)**  
**2.2: Develop proposals, if necessary, for amendments to the *Technical Instructions for the Safe Transport of Dangerous Goods by Air* (Doc 9284) for incorporation in the 2025-2026 Edition**

### **PROPOSED REVISION TO THE PACKING INSTRUCTION 967**

(Presented by G. Peng)

#### **SUMMARY**

This information document suggests to adjust the upper limit of Watt-hour rating of lithium ion cells in section II of Packaging Instruction 967 from 20 Wh to 30 Wh.

## **1. INTRODUCTION**

1.1 In order to specify the transport regulations of lithium ion cells and batteries contained in equipment, UN 3481 and the corresponding Packing Instruction 967 were added in the *Technical Instructions for the Safe Transport of Dangerous Goods by Air* (2009-2010 Edition). The Packing Instruction 967 was divided into two parts: part 1 and part 2. The lithium ion cells with a Watt-hour rating of more than 20 Wh were classified as part 2, and the lithium ion cells with a Watt-hour rating of no more than 20 Wh were classified as part 1. Later, section I and section II were used in the packing instruction to replace part 2 and part 1 respectively.

1.2 With the innovation and development of electronic equipments and lithium battery technology for more than 10 years, the types of portable electronic devices contained lithium ion batteries are increasing, and the lithium ion battery capacity is also growing. Based on the research on the Watt-hour ratings of 158 mobile phones, 90 tablets and 319 laptops of 31 mainstream brands in the market, the following conclusions are drawn: (1) the Watt-hour rating of all laptops exceeds 35 Wh. (2) 67.8% of tablets with Watt-hour ratings less than 30 Wh. (3) The maximum Watt-hour rating of mobile phone batteries has increased from 19 Wh to 23 Wh, there are 11 types of mobile phones with Watt-hour rating

over 20 Wh, and there is a trend towards high-capacity battery mobile phones in the future (see appendix).

1.3 Some electronic equipments containing more than 20 Wh single cell or single cell battery, of which meets the requirements of UN 38.3. Considering all factors of safety, these single cells or single cell batteries do not show higher risks than batteries with the same rated energy. However, the electronic equipments containing more than 20 Wh single cell or single cell battery must meet more transportation requirements, and they are not treated the same as the electronic equipments containing the same rated energy battery.

1.4 The electronic equipments transported according to the Packing Instruction 967 section I must fill in the shipper’s declaration for dangerous goods and the Notification to Captain as required, and stick the lithium battery label on the package. The electronic equipments transported according to the Packing Instruction 967 section II only need to stick the lithium battery mark on the package and indicate on the air waybill. The existing rules hinder the facilitation of air transportation of electronic equipment with rated energy of 20 to 30 Wh of lithium ion cell or single cell battery.

1.5 In consideration of the safety risks of large capacity cells and single cell batteries, this proposal does not recommend the modification of the rated energy related to lithium ion cells and batteries transported separately or packaged with equipment.

1. **DISCUSSION**

1.1 The DGP is invited to consider adjusting the upper limit of watt-hour rating of lithium ion cells in Part II of Packaging Instruction 967 from 20 Wh to 30 Wh:

Packing Instruction 967
<p>...</p> <p><b>II. SECTION II</b></p> <p>...</p> <p>Lithium ion cells and batteries may be offered for transport provided that each cell and battery meets the provisions of 2.9.3 a), e) and g) and the following:</p> <ol style="list-style-type: none"> <li>1) for lithium ion cells, the Watt-hour rating (see the Glossary of Terms in Attachment 2) is not more than <del>20</del><u>30</u> Wh;</li> <li>2) for lithium ion batteries, the Watt-hour rating is not more than 100 Wh; <ul style="list-style-type: none"> <li>— the Watt-hour rating must be marked on the outside of the battery case except for those batteries manufactured before 1 January 2009.</li> </ul> </li> </ol> <p>...</p>

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**APPENDIX**

Based on the research on the Watt-hour ratings of 158 mobile phones, 90 tablets and 319 laptops of 31 mainstream brands in the market, the following conclusions are drawn:

- 1) The Watt-hour rating of all 319 laptops exceeds 35 Wh, See Figure 1 for the distribution diagram.

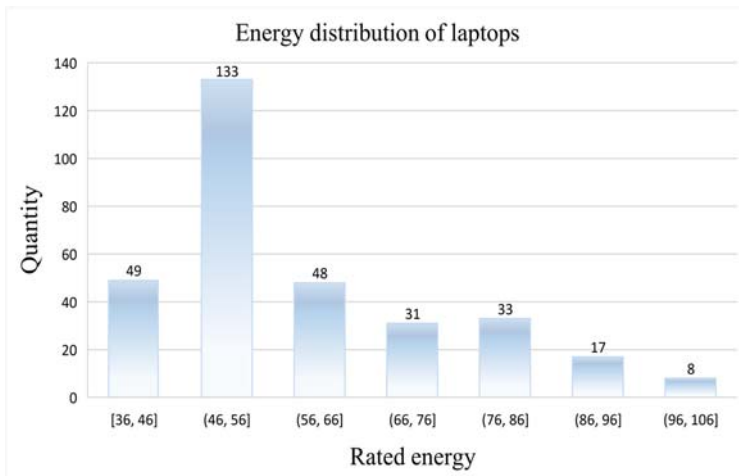


Figure 1

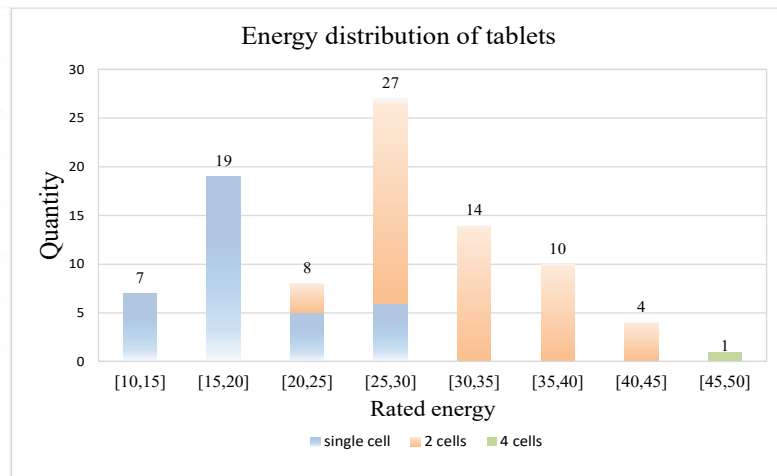


Figure 2

- 2) There are 26 tablets with a Watt-hour rating of less than 20Wh, all of which are single cell. There are 35 tablets with Watt-hour rating in the range of [20, 30], including 11 tablets with single battery cell. See Figure 2 for the distribution diagram.
- 3) In the past 10 years, the capacity of mobile phone batteries has increased year by year, See Figure 3 for capacity changes.

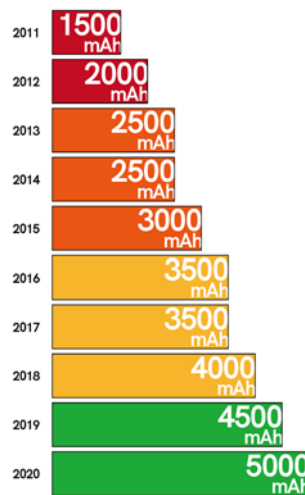


Figure 3

- 4) At present, the maximum capacity of mobile phone battery has reached 6000 mAh, and the Watt-hour rating has reached 23 Wh. Among 158 mobile phones, there are 11 types with Watt-hour rating over 20 Wh, including 8 types with single cell batteries.