



**WORKING PAPER**

**DANGEROUS GOODS PANEL (DGP)  
WORKING GROUP MEETING (DGP-WG/16)**

**Montreal, 17 to 21 October 2016**

**Agenda Item 2: Development of recommendations for amendments to the *Technical Instructions for the Safe Transport of Dangerous Goods by Air (Doc 9284)* for incorporation in the 2019-2020 Edition**

**2.4: Part 4 — Packing Instructions**

**STRONG RIGID OUTER PACKAGINGS**

(Presented by B. Carrara)

**SUMMARY**

This working paper highlights inconsistencies with respect to the use of strong outer packagings, rigid or not, in Packing Instructions 965 to 970.

**Action by the DGP-WG:** The DGP-WG is invited to consider inconsistencies among the provisions for lithium batteries through the analysis of the table provided in Appendix A to this working paper. If considered necessary, the DGP-WG is invited to amend the applicable packing instructions to maintain consistency. Appendix B presents an amendment suggestion.

**1. INTRODUCTION**

1.1 The Dangerous Goods Panel Working Group Meeting in 2015 (DGP-WG/15, Montréal, 27 April to 1 May 2015) agreed with using the term “rigid” to qualify strong outer packagings in packing instructions related to lithium batteries.

1.2 The original proposal in DGP-WG/15-WP/6 suggested the inclusion of “rigid” only in Section II of Packing Instructions 965 to 970. However, a dedicated working group agreed with applying the term to other parts of the packing instructions.

1.3 Appendix A shows, through the use of underlined text, the occurrences of “strong outer packaging” and “strong rigid outer packaging” in Packing Instructions 965 to 970. The cells highlighted in yellow show provisions with inconsistencies (inconsistent text is highlighted in red) by comparing the text in the packing instructions for lithium ion batteries versus lithium metal batteries.

1.4 In general, it is possible to note that the qualifying term “rigid” was added only to Sections IB and II. Packages containing cells or batteries prepared in accordance with Section IA of Packing Instructions 965 and 968 or Section I of Packing Instructions 966 and 969 are already subject to the requirements of Part 4;1 and Packing Group II performance requirements. Notwithstanding the foregoing, the term “rigid” appears in Section I of Packing Instruction 970 but the same does not happen in Packing Instruction 967.

1.5 Beyond that, we noted that the wording used to require conformity with Part 4;1.1.1, 1.1.3.1 and 1.1.10 (except 1.1.10.1) in Section II of Packing Instructions 967 and 970 is not the same. Packing Instruction 967 refers to “equipment” and Packing Instruction 970 refers to “equipment containing batteries”. Reviewing the text under the General requirements (Section I.1) of the same packing instructions, it is possible to note the usage of just “equipment”. Additionally, since Packing Instructions 967 and 970 are related to lithium batteries contained in equipment, saying “equipment containing batteries” is redundant and unnecessary.

1.6 Furthermore, the first requirement in Section II.2 (Additional requirements) of Packing Instructions 966 and 969 differs from each other. In Packing Instruction 966, the requirement is applicable to cells AND batteries while in Packing Instruction 969 it is applicable to cells OR batteries. This could cause confusion in interpreting the regulations.

## 2. ACTION BY THE DGP-WG

2.1 The DGP-WG is invited to review the current provisions for lithium batteries by analysing the table provided in Appendix A to this working paper.

2.2 If considered necessary, the DGP-WG is invited to amend the applicable packing instructions to maintain consistency. Appendix B presents an amendment suggestion.

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APPENDIX A

| LITHIUM ION BATTERIES |        |          |   |  | LITHIUM METAL BATTERIES |  |   |   |             |
|-----------------------|--------|----------|---|--|-------------------------|--|---|---|-------------|
| PI                    | Sec.   | Sub-Sec. | Text  | Rigid (Y/N)  | PI                      | Sec.   | Sub-Sec.  | Text  | Rigid (Y/N) |
| PI 965                | IA     | IA.2     | Lithium ion batteries with a mass of 12 kg or greater and having a strong, impact-resistant outer casing, or assemblies of such batteries, may be transported when packed in <u>strong outer packagings</u> or protective enclosures (e.g. in fully enclosed or wooden slatted crates) not subject to the requirements of Part 6 of these Instructions, if approved by the appropriate authority of the State of Origin. A copy of the document of approval must accompany the consignment. | N  | PI 968                  | IA   | IA.2  | Lithium metal batteries with a mass of 12 kg or greater and having a strong, impact-resistant outer casing, or assemblies of such batteries, may be transported when packed in <u>strong outer packagings</u> or protective enclosures (e.g. in fully enclosed or wooden slatted crates) not subject to the requirements of Part 6 of these Instructions, if approved by the appropriate authority of the State of Origin. A copy of the document of approval must accompany the consignment. | N           |
|                       |        | IB       | IB.1  | Cells and batteries must be packed in <u>strong outer packagings</u> that conform to Part 4;1.1.1, 1.1.3.1 and 1.1.10 (except 1.1.10.1). |                         |  | N   | IB  | IB.1        |
|                       | IB.2   |          | Cells and batteries must be packed in inner packagings that completely enclose the cell or battery then placed in a <u>strong rigid outer packaging</u> .   | Y  |                         | IB.2   | Cells and batteries must be packed in inner packagings that completely enclose the cell or battery then placed in a <u>strong rigid outer packaging</u> . |   | Y           |
|                       | II     | II.1     | Cells and batteries must be packed in <u>strong outer packagings</u> that conform to Part 4;1.1.1, 1.1.3.1 and 1.1.10 (except 1.1.10.1).  | N  |                         | II   | II.1  | Cells and batteries must be packed in <u>strong outer packagings</u> that conform to Part 4;1.1.1, 1.1.3.1 and 1.1.10 (except 1.1.10.1).  | N           |
|                       |        | II.2     | Cells and batteries must be packed in inner packagings that completely enclose the cell or battery then placed in a <u>strong rigid outer packaging</u> .   | Y  |                         |  | II.2  | Cells and batteries must be packed in inner packagings that completely enclose the cell or battery, then placed in a <u>strong rigid outer packaging</u> .  | Y           |
|                       | PI 966 | II       | II.1  | Cells and batteries must be packed in <u>strong outer packagings</u> that conform to Part 4;1.1.1, 1.1.3.1 and 1.1.10 (except 1.1.10.1). |                         | N  | PI 969  | II  | II.1        |
| II.2                  |        |          | Lithium ion cells <b>and</b> batteries must: be placed in inner packagings that completely enclose the cell or battery, then placed in a <u>strong rigid outer packaging</u> ; or   | Y  | II.2                    | Lithium metal cells <b>or</b> batteries must: be placed in inner packagings that completely enclose the cell or battery, then placed in a <u>strong rigid outer packaging</u> ; or |   |   | Y           |
|                       |        |          | be placed in inner packagings that completely enclose the cell or battery, then placed with the equipment in a <u>strong rigid outer packaging</u>  | Y  |                         | be placed in inner packagings that completely enclose the cell or battery, then placed with the equipment in a <u>strong rigid outer packaging</u>                                 |   |   | Y           |
| PI 967                | I      | I.1      | Equipment must be packed in <u>strong outer packagings</u> that conform to Part 4;1.1.1, 1.1.3.1 and 1.1.10 (except 1.1.10.1).  | N  | PI 970                  | I  | I.1   | Equipment must be packed in <u>strong rigid outer packagings</u> that conform to Part 4;1.1.1, 1.1.3.1 and 1.1.10 (except 1.1.10.1).  | Y           |
|                       |        | I.2      | The equipment must be packed in <u>strong outer packagings</u> constructed of suitable material of adequate strength and design in relation to the packaging's capacity and its intended use unless the battery is afforded equivalent protection by the equipment in which it is contained.  | N  |                         |  | I.2   | The equipment must be packed in <u>strong outer packagings</u> constructed of suitable material of adequate strength and design in relation to the packaging's capacity and its intended use unless the battery is afforded equivalent protection by the equipment in which it is contained.  | N           |
|                       |        | I.3      | Outer packagings<br><u>Strong outer packagings</u>  | N  |                         |  | I.3   | Outer packagings<br><u>Strong outer packagings</u>  | N           |
|                       | II     | II.1     | Equipment must be packed in <u>strong outer packagings</u> that conform to Part 4;1.1.1, 1.1.3.1 and 1.1.10 (except 1.1.10.1).  | N  |                         | II   | II.1  | Equipment containing batteries must be packed in <u>strong outer packagings</u> that conform to Part 4;1.1.1, 1.1.3.1 and 1.1.10 (except 1.1.10.1).   | N           |
|                       |        | II.2     | The equipment must be packed in <u>strong rigid outer packagings</u> constructed of suitable material of adequate strength and design in relation to the packaging's capacity and its intended use unless the battery is afforded equivalent protection by the equipment in which it is contained.  | Y  |                         |  | II.2  | The equipment must be packed in <u>strong rigid outer packagings</u> constructed of suitable material of adequate strength and design in relation to the packaging's capacity and its intended use unless the battery is afforded equivalent protection by the equipment in which it is contained.  | Y           |



**APPENDIX B**

**PROPOSED AMENDMENT TO PART 4 OF THE TECHNICAL INSTRUCTIONS**

**Part 4**

**PACKING INSTRUCTIONS**

**Chapter 11**

**CLASS 9 — MISCELLANEOUS DANGEROUS GOODS**

**Packing Instruction 967**

Passenger and cargo aircraft for UN 3481 (contained in equipment) only

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**I. SECTION I**

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**I.2 Additional requirements**

- The equipment must be secured against movement within the outer packaging and be packed so as to prevent accidental operation during air transport.
- The equipment must be packed in strong **rigid** outer packagings constructed of suitable material of adequate strength and design in relation to the packaging's capacity and its intended use unless the battery is afforded equivalent protection by the equipment in which it is contained.
- Batteries manufactured after 31 December 2011 must be marked with the Watt-hour rating on the outside case.

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**Packing Instruction 969**

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**I. SECTION II**

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**II.2 Additional requirements**

- Lithium metal cells ~~or~~ **and** batteries must:
  - be placed in inner packagings that completely enclose the cell or battery, then placed in a strong rigid outer packaging; or

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Packing Instruction 970

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II. **SECTION II**

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II.1 **General requirements**

Equipment containing batteries must be packed in strong outer packagings that conform to Part 4;1.1.1, 1.1.3.1 and 1.1.10 (except 1.1.10.1).

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