



**WORKING PAPER**

**DANGEROUS GOODS PANEL (DGP)  
WORKING GROUP OF THE WHOLE ON LITHIUM BATTERIES**

**FIRST MEETING**

**Montréal, 6 to 10 February 2012**

**REPORT OF THE MEETING**

**1. INTRODUCTION**

1.1 The meeting of the Dangerous Goods Panel Working Group of the Whole on Lithium Batteries (DGP-WG/LB/1) was opened by Mr. C. Schleifer-Heingärtner, President of the Air Navigation Commission, on 7 February 2012 in Montréal. Mr. G. Leach was elected Chairperson of the meeting and Ms. K. Vermeersch was elected Vice-Chairperson. The Secretary of the meeting was Dr. K Rooney, assisted by Ms. L McGuigan.

1.2 The need for a working group meeting was raised during discussions at DGP/23 on a proposal to reduce the maximum quantities of lithium ion and lithium metal batteries currently excepted from most of the requirements of the Technical Instructions. At DGP/23, a number of panel members felt that more time was needed to consider the issue, since the original proposal was modified at a late stage making consultation within their States impossible. All members agreed that the subject of lithium batteries needed to be further reviewed, with an emphasis on addressing concerns related to bulk shipments of excepted batteries. At the request of the Universal Postal Union (UPU), members also agreed to devote time during the lithium battery working group to discuss the differences which currently exist between the UPU Convention and the Technical Instructions in relation to lithium batteries contained in equipment in the mail.

**2. ATTENDANCE**

2.1 The meeting was attended by the following panel members, advisers and observers:

<b>Members</b>	<b>Advisers/Observers</b>	<b>State/International Organization</b>
	Z. Welscherheimb	Austria
A. Tusek	T. Amos	Australia

<b>Members</b>	<b>Advisers/Observers</b>	<b>State/International Organization</b>
K. Vermeersch		Belgium
B. Carrara	S. Dias	Brazil
M. Paquette	D. Evans D. Lamarche D. Sylvestre T. Howard	Canada
X. Qing	A. Song Q. Zhenhua W.K. Chan	China  (Hong Kong SAR)
J. Le Tonqueze	F. Jacquemont	France
H. Brockhaus	G. Closhen M. Marx L. Michels H. J. Niegel S. Pinto B.-U. Wienecke	Germany
K. Koume	A. Awano A. Furukawa M. Horie K. Sekai H. Shima A.J. Sirjord I. Uehara S. Yabe	Japan
S-W. Park	W. Seung	Republic of Korea
T. Muller	D. Kampman D. Treffers	Netherlands, Kingdom of the
	V. Koh A. Tang	Singapore
L. Calleja Barcena		Spain

<b>Members</b>	<b>Advisers/Observers</b>	<b>State/International Organization</b>
H. Al Muhairi	P. Balasubramanian A. Al Hamili R. Al Kaabi P. King A.J. Piera Valdés	United Arab Emirates
G. Leach	I. Bryer R. McLachlan	United Kingdom
J. McLaughlin	M. Givens T. Kenny D. Pfund G. Sarkos V. Sutherland H. Webster	United States of America
D. Brennan	N. Hanif P. Liu P. Oppenheimer	International Air Transport Association (IATA)
M. Rogers	J. Haynes S. Schwarz	International Federation of Air Line Pilots' Associations (IFALPA)
	A. Altemos N. McCulloch F. Wybenga	DGAC
	A. McCulloch B. McClelland	Global Express Association (GEA)
	M. Babiak M. Boolish C. Updyke	National Electrical Manufacturers Association (NEMA)
	F. Bognar	North Atlantic Treaty Organization (NATO)
	George Kerchner C. Monahan	The Rechargeable Battery Association (PRBA)

<b>Members</b>	<b>Advisers/Observers</b>	<b>State/International Organization</b>
	E. Andersen D. Davis S. Kamibayashi A. MacRae R. Miskanic A. Miyaji	Universal Postal Union (UPU)

2.2 Noting the importance of the meeting, every effort was made by the Secretariat to communicate with the following members who were unable to attend: Messers. Evans (New Zealand), Gelsomino (Italy) and Mirko (Russian Federation).

### 3. REVIEW OF THE REPORT

#### 3.1 Agenda Item 1: Carry-over work from DGP/23

##### 3.1.1 Amendments to the lithium battery provisions (DGP-WG/LB/1-WP/1, DGP-WG/LB/1-WP/4, DGP-WG/LB/1-WP/8 and DGP-WG/LB/1-WP/9)

3.1.1.1 The DGP-WG/LB was presented with the proposal originally considered at DGP/23 on reducing the maximum quantities of lithium ion and lithium metal batteries currently permitted under Section II of Packing Instructions 965 and 968 (DGP-WG/LB/1-WP/1) (DGP (see paragraph 5.1.7 of the DGP/23 Report (DGP/23-WP/102)).

3.1.1.2 The meeting was briefly reminded that the intent of that proposal was to address risks associated with transporting lithium batteries, which were felt to be significant based on FAA Technical Centre test results (see paragraph 5.1.7.1 of the DGP/23 Report (DGP/23-WP/102)). These risks were compounded by the substantial increase of batteries being transported, the increase in energy density of modern lithium batteries, and the expected future upward trend (estimated by some to be 400% growth in the coming year) for both. Exceptions to the full regulations which currently existed did not seem justifiable considering these risks. By adopting the amendment, it was felt that significant safety measures would be introduced. Training would be required for shippers transporting lithium batteries, operator acceptance checks for compliance prior to loading and stowage aboard an aircraft would be required, and pilots would be notified of the presence, location and quantity of lithium batteries aboard the aircraft.

3.1.1.3 There was consensus from panel members that details of large quantities of excepted batteries should be provided to the pilot-in-command. Some panel members felt, however, that the additional cost and burden to currently compliant shippers which would result if lithium batteries were fully regulated might have a negative effect on compliance, since some shippers would be tempted to avoid costs by shipping lithium batteries as undeclared dangerous goods. On that basis, a modified proposal was presented which would allow shipments of lithium batteries which currently met the existing provisions of Section II to be shipped in non-UN specification packagings (DGP-WG/LB/1-WP/9). This would alleviate the burden of cost to shippers while still achieving the objective of providing information to the pilot-in-command.

3.1.1.4 Some panel members felt the new proposal would still result in an unnecessary burden to shippers and that alternate options which would provide for a notification to captain (NOTOC) without

subjecting all batteries to full regulation should be considered. It was strongly suggested by operators, however, that providing such information would be extremely difficult outside of the regulatory framework, given the sheer volume of excepted lithium battery shipments. The only effective way to provide for a NOTOC would be for shipments to fit within the existing regulatory framework (DGP-WG/LB/1-WP/8 and DGP-WG/LB/1-WP/9).

3.1.1.5 Although there was support for the general principle of the modified proposal, it was felt that providing for non-UN specification packaging on a fully-regulated shipment through yet another lithium battery special provision would increase the complexity of the regulations and would affect multi-modal harmonization. After much discussion, it was agreed to separate Packing Instructions 965 and 968 into three sections, categorized as follows:

- a) Section IA would apply to lithium cells or batteries which exceeded the Watt-hour rating (Packing Instruction 965) or lithium content (Packing Instruction 968) specified in Section II. These would be subject to the full requirements of the Technical Instructions;
- b) Section IB would apply to lithium cells and batteries which exceeded the quantities but not the Watt-hour ratings/lithium metal content limits in Section II. These would be subject to most of the requirements of the Technical Instructions, except non-UN specification packagings could be used and alternative written documentation could be provided. The operator would be required to retain the information provided on the written documentation. The lithium battery handling label would be required in addition to the Class 9 hazard label; and
- c) Section II would apply to significantly lower quantities of lithium cells and batteries than what is currently permitted under Section II. These would be excepted from most of the requirements of the Technical Instructions.

3.1.1.6 The proposal was supported by a large majority of the members. In developing the amendments, a balance between the needs of operators, pilots, shippers and regulators was struck. Training would now be required for many more shippers preparing lithium battery shipments; operators would now be required to perform acceptance checks on all large shipments of lithium batteries prior to loading and stowage aboard an aircraft; pilots would be notified of the presence, location and quantity of lithium batteries aboard the aircraft; shippers would be relieved of costs related to UN specification packaging/documentation requirements; and regulators would be provided a framework in which better training, oversight and enforcement could be applied. It was noted that the information for large lithium battery shipments which operators would now be required to retain could assist States in risk-based prioritization for inspecting shippers. Bearing in mind safety management systems (SMS) principles, information obtained through the regulatory framework would be an essential tool in developing outreach and training programmes and predicting future risks so that measures could be taken to mitigate them.

3.1.1.7 Panel members accepted that the new provisions could not of themselves prevent further lithium battery-related incidents or accidents from occurring due to non-compliance with the regulations. It was acknowledged that there were many risks involved with transporting lithium batteries and that full regulation would not address them all. Errors in applying the regulations were possible and non-compliance, both inadvertent and intentional, was a reality. More outreach, oversight and appropriate enforcement would therefore be necessary. Other panel members felt that the additional training requirements, acceptance checks, and inspection requirements in the new provisions could reduce the potential for incidents, and that the new pilot notification requirements could positively influence the outcome of an incident. Referring to the ANC Commissioner's presentation on SMS principles (see

paragraph 3.6), it was noted that multiple lines of defence needed to be in place so that weaknesses in any one of those lines would be compensated by others. These included all of the safety mechanisms provided through the Instructions along with additional mechanisms. Studies were underway in some States on different forms of packaging, possibilities of mitigating risk through reduced state of charge, and fire suppression systems. All of these were potential for additional safety mechanisms.

3.1.1.8 Recognizing the risks in shipping lithium batteries which could not be mitigated through the regulatory framework, a proposal which contained recommendations for future consideration by the DGP and by other ANC panels was presented to the panel (DGP-WG/LB/1-WP/4). Some of these were addressed by the amendments to Packing Instructions 965 and 968. Others included:

- a) Provisions for electronic data processing (EDP) or electronic data interchange (EDI) should be added to Section II. It was felt, however, that multi-modal processes for handling excepted lithium batteries would first need to be taken into account through discussions at the UN. Some felt that the existing provisions in the Instructions would already provide for these techniques. Drawing attention to the note at the beginning of Part 5;4 which states that the Instructions do not preclude the use of EDP and EDI transmission techniques as an alternative to paper documentation, it was felt they could be applied.

The added value of the document required in Section II was questioned during discussion on this issue, recognizing that the information in it was already provided for on the handling label. This was also something which could be raised at the UN

- b) Hazard communication for fully regulated batteries should be reviewed and discussed at the UN. It was suggested that Class 9 hazard labels on packages containing lithium batteries did not provide true hazard communication in that this class included dangerous goods which did not pose the same type or level of risk as lithium batteries (e.g. dry ice, environmentally hazardous material). Specific hazard communication for energy storage devices was the subject of discussion at previous UN meetings; it was agreed that the subject should be revisited. Panel members would continue discussions through correspondence in an effort to develop suggestions for the UN.

It was noted that some of the safety measures required in Section II of the packing instructions, including the lithium battery handling label which did provide additional hazard information, would be lost when lithium batteries were subject to Section I requirements. The irony of having additional safety measures in Section II which were not in Section I would be raised at the UN.

- c) Incidents involving lithium batteries should be reported to ICAO for publishing on a publicly-accessible website. This idea was supported by panel members, recognizing that such information provided tools for indentifying causal factors and potential gaps in regulations. In developing such a system, consideration of privacy policies within States would need to be taken into account. The intent of the system would need to be made clear and criteria for collecting the data would have to be determined. The working group understood that the establishment of such a site would be dependent on resources available to ICAO. The Secretary would determine what was feasible within the Secretariat, noting that there had been increased efforts by ICAO for data collection in support of SMS. It was agreed to continue discussions on this issue through correspondence.

- d) The appropriate ANC panel should review the fire suppression abilities of Class E cargo compartments and consider requirements for fire suppression systems in all cargo compartments. One member reported that much work was underway in their State to find alternative solutions to address risks related to Class E compartments which were viable and cost effective. These included fire suppression in ULDs and pallet covers. The Secretary agreed to convey the issue to the appropriate areas within the Secretariat.
- e) Whether a crew of two was adequate for cargo aircraft above a certain size should be considered. Although the feasibility and effectiveness of this was questioned, the Secretary agreed to raise the issue with the Secretary of the Operations Panel (OPSP).

***Other issues raised during discussion of DGP-WG/LB/1-WP/1, DGP-WG/LB/1-WP/4, DGP-WG/LB/1-WP/8 and DGP-WG/LB/1-WP/9***

3.1.1.9 A gap in the current provisions applicable to lithium batteries packed with equipment according to Section II of Packing Instruction 966 and Packing Instruction 969 was suggested whereby the quantity of lithium batteries permitted in a single package was limited only by the number of pieces of equipment which accompanied them. It was suggested that this gap could enable a shipper to pack hundreds of lithium batteries in a single package. New tables limiting the quantities were therefore proposed and agreed.

3.1.1.10 It was proposed that the lithium battery handling label should be applied to overpacks containing large quantities of lithium battery packages which did not require a handling label and that the air waybill statement must be provided. The proposal was based on the potential for consignments to consist of multiple overpacks containing hundreds of individual packages of which it was suggested the operator should be aware of. Although there was sympathy for the proposal, it was not agreed on the basis it would not always be possible to determine how many batteries were in an overpack when it contained both packages containing lithium batteries and packages not containing lithium batteries.

3.1.1.11 Clarification was sought on the quantity limits which currently exist in Section II of Packing Instruction 965 and 968 whereby separate limits were provided for lithium cells and lithium batteries. It was noted that similar text appeared in UN Special Provision 188. Some interpreted this to mean that a package could contain the maximum quantity permitted for cells plus the maximum quantity permitted for batteries. It was agreed, however, that the maximum quantities applied to either batteries or cells and could not be combined. Text clarifying this was added to Packing Instructions 965 and 968.

3.1.1.12 A provision for smaller hazard and handling labels when the size of a package precluded the regular size was proposed but not supported. It was noted that proposals for smaller labels on other packages had been presented in the past (see paragraph 2.6.3 of the DGP/23 Report (DGP/23-WP/102)). The panel's position was that labels were a primary means of communication, and reducing their size would lower safety standards. Packages would need to be large enough to accommodate the labels.

**3.1.2 Section II Lithium Batteries — Loading Requirements (DGP-WG/LB/1-WP/2)**

3.1.2.1 The amendment proposed in this working paper was deferred at DGP/23 until a final decision on lithium battery exceptions was reached (see paragraph 3.1.1). Based on the decision, the proposal was no longer relevant. The paper was withdrawn.

### 3.1.3 **Lithium Battery Pilot Notification Requirements (DGP-WG/LB/1-WP/3)**

3.1.3.1 This working paper was also prepared for DGP/23 but deferred until a final decision on lithium battery exceptions was reached. The paper contained a proposal to reduce the amount of information required on the notice to pilot-in-command for shipments of lithium ion and lithium metal batteries. The proposal was made based on a recognition that the decision to reduce the maximum quantities of lithium ion and lithium metal batteries currently excepted from full regulation would greatly increase the number of entries on the notice to the pilot-in-command. The amendment was agreed.

### 3.2 **Agenda Item 2: ANC work items**

#### 3.2.1 **Lithium battery related tests (Test Data on Lithium Ion Batteries (DGP-WG/LB/1-WP/5)), Lithium Metal Batteries (DGP-WG/LB/1-WP/7))**

3.2.1.1 The validity of the FAA test results reported at DGP/23 was disputed by battery manufacturing representatives (see paragraph 5.1.7.1 of the DGP/23 Report). A letter (see Appendix B to DGP-WG/LB/1-WP/5) had been sent to the Secretary expanding on comments raised at DGP/23, specifically in relation to the FAA's report on a risk model for freighter fire accidents caused by cargo compartment fire. The Secretary subsequently asked ICAO's Integrated Safety Management Section to analyse the FAA's study and the suggestion by the battery manufacturer representative that it was based on flawed assumptions, unsound methodology and faulty data. She also asked the FAA to respond to the comments raised by the battery manufacturer association.

3.2.1.2 The Secretary reported that although the Integrated Safety Management Section observed that the sample period for the study was very long, it saw no significant issue or problem with the risk model itself. A representative from the FAA Technical Center responded to each point raised in the letter sent to the Secretary. He disputed most of the points raised, and emphasized that beyond the study, fire hazards posed by lithium battery shipments by air were evident from numerous lithium battery incidents, concerns raised by accident investigations related to lithium batteries, fire tests on lithium batteries (see paragraph 5.1.7.1 a) and b) of the DGP/23 Report)), and the close proximity of two freighter fire accidents in 2010 and 2011. The battery manufacturer representative expressed his appreciation to ICAO and the FAA for responding to the letter. He reported that a third party consultant was hired to write the report on the FAA analysis. The letter was based on a preliminary report; a detailed analysis would be complete within the next three months.

3.2.1.3 At DGP/23, it was recognized that few test results had been reported other than those by the FAA Technical Center. During the review of the DGP/22 Report, the ANC had asked the DGP to consider new possible tests which could be performed on batteries. Accordingly, the Secretary reminded the panel of the desirability for more testing. Reports on testing were provided as follows:

#### ***Lithium ion tests***

3.2.1.4 Test results on lithium ion batteries were reported by a battery manufacturer representative. The results of four tests were interpreted as follows:

- a) Flammability assessment of lithium ion batteries packed with and contained in equipment. The results of this study suggested that the chemical and electrical energy contained in batteries was a small percentage of the total energy released if the entire package was burned; the packaging material produced the bulk of the heat release;



and flames were likely to self extinguish due to limited airflow before the cells in the package vent or go into thermal runaway. Spontaneous thermal runaway of cells inside equipment did produce smoke and soot, but this was mitigated when cells were at a reduced state of charge.

- b) FAA-Style flammability assessment of lithium ion cells and battery packs in aircraft cargo holds. The results of this study suggested that a direct flame on bare cells and batteries could lead to internal thermal runaway of individual cells and venting of gases and that it was possible for cells to rupture and for their contents to be ejected. Halon 1301 was effecting in controlling fire. Direct flame over a few minutes on bulk packages of cells at 50 per cent or less state of charge did not lead to significant venting or involvement of cells in the fire.
- c) FAA-style flammability assessment on single and multiple cell-phone-style (prismatic) lithium ion cells and battery packs in aircraft cargo holds – prismatic battery packs and pressure measurements. Results were similar. Prismatic cells produced very little pressure effect.
- d) Effect of state of charge on outcome of internal cell faults. Test results suggested that a lower state of charge reduces the degree to which a lithium ion cell reacts.

### ***Lithium metal tests***

3.2.1.5 Test results on lithium metal batteries were reported by a representative of the National Electrical Manufacturers Association. These were interpreted as follows:

- a) Flammability assessment of lithium metal batteries packed with and contained in equipment. The results of this test suggested that the bulk of heat release was from the packaging material.
- b) Flame attack testing. The results of this test suggested that flames typically extinguish within five minutes due to limited airflow; cell venting or thermal runaway did not occur when packed in large, strong outer packaging; and cells did not affect combustion of surrounding packaging material.
- c) Cell initiating testing on a single cell contained in or packed with equipment resulted in heat damage to adjacent systems and/or packing materials but cell thermal runaway did not propagate to adjacent systems.

3.2.1.6 It was suggested that the test results for lithium ion tests were very similar to the results obtained by the FAA Technical Center, although they were interpreted differently. It was also suggested that the testing environments for both battery types were not typical of conditions of transport. Questions were also raised about whether the flammable nature of the venting gasses was accounted for, and whether enough heat had been generated in the tests to properly simulate a cargo compartment fire. The meeting was reminded that although Halon did have an effect on external fire, it had very little effect on lithium metal itself. There was agreement that testing results related to state of charge appeared to have merit, but it was felt that much more testing needed to be done before making any final conclusions (see paragraph 3.3.1).

### **3.3 Provisions to be considered by the United Nations**

#### **3.3.1 Proposal for Lithium Rechargeable Battery Transportation to Reduce Risk of Fire Propagation (DGP/23-WP/11)**

3.3.1.1 The working group was informed of test results related to reduced state of charge. Tests in one State suggested that direct exposure to flame did not lead to fire or explosion when lithium batteries were packed with 30 per cent state of charge. To reduce the risk of fire propagation, it was therefore proposed to introduce requirements in the Technical Instructions for lithium batteries to be shipped at a reduced state of charge. Test results related to use of a non-flammable film to protect against lithium ion cells and battery packages from catching fire due to an adjacent fire source were also reported. It was suggested that the non-flammable film used did protect packages from fire.

3.3.1.2 Other members and meeting participants reported that similar tests were being conducted within their States and organizations which suggested state of charge might be an effective mitigation tool. However, variances in test results were derived between different sized batteries and between batteries produced by different manufacturers. It was felt that much more testing was needed before coming to any firm conclusions. Incorporating any new requirements related to state of charge would first need to be addressed at the UN.

3.3.1.3 In relation to test results on the use of a non-flammable film to protect packages from fire, it was suggested that the fire used in the test was very small and not indicative of a fire which might occur in a cargo compartment. Again, it was felt that much more testing was needed before any firm conclusions could be reached.

#### **3.4 Outreach and guidance on the safe handling of lithium batteries**

3.4.1 The working group considered training and outreach and their importance in ensuring that shippers complied with lithium batteries. Recognizing that the new provisions for lithium batteries agreed by the working group (paragraph 3.1.1) would require shippers to be trained in accordance with the Instructions, the meeting felt there would be a great impetus for the development of specific training programmes for shippers of lithium batteries. The competency frameworks developed at DGP/23 for shippers and freight forwarders would facilitate the development of quality programmes, and panel members agreed that sharing ideas and material should be greatly encouraged.

3.4.2 Members reported on training programmes which were already in place and/or being developed within their States and international organizations. These included competency-based classroom courses for shippers of lithium batteries, e-learning courses for Section II lithium batteries, and videos explaining lithium battery requirements.

3.4.3 The need for oversight and enforcement action was discussed throughout the working group meeting, as many believed the root cause of lithium battery incidents was non-compliance. Although many States expressed difficulties in fulfilling their oversight responsibilities due to the large number of shippers, it was agreed the need for this was key to making shippers aware of their responsibilities. It was suggested that the new lithium battery provisions would provide a better framework for obtaining information on shippers which would enable regulators to implement an effective risk-based prioritization system for inspections.

### 3.5 **Agenda Item 3: Lithium battery-related incidents and accidents**

3.5.1 The meeting was provided with an update on an incident involving a consignment of lithium ion batteries which were classified as UN 3481, **Lithium ion batteries contained in equipment** in which a ground handling agent observed smoke being emitted from a pallet on the ramp prior to loading. The pallet contained electric bicycle batteries. A preliminary analysis of the incident was carried out by the transportation safety board within the State and a detailed analysis was expected. There were no immediate concerns with the assembly of the battery, the design of the equipment, or the manner in which the packages were stacked inside the overpack. Since the incident, the shipper had modified internal procedures by reducing the state of charge of the battery to between 30 and 40 per cent, charging the batteries once, waiting three days and charging again, and restricting carriage to cargo aircraft.

3.5.2 During discussions of the incident it was revealed that panel members had differing opinions on what constituted “contained in equipment”. Some felt that the shipment should have been classified as lithium batteries on their own (UN 3480) and that the casing in which the battery was contained should not be considered equipment. It was suggested that appropriate definitions be included in the Instructions, but this would first need to be raised at the UN.

3.5.3 The panel member reporting the incident offered to provide the findings of the transportation safety board once they were final.

3.5.4 The working group expressed its appreciation for the update and reiterated the importance of sharing such information.

### 3.6 **Agenda Item 4: Integrating SMS into the development of dangerous goods provisions**

3.6.1 An overview of safety management systems and ICAO’s role in implementing them was provided by an Air Navigation Commissioner. The Commissioner recognized it may be difficult to incorporate all principles into all parts of the dangerous goods transport system, but he encouraged the working group to consider adopting ones which could be. He suggested that one of the most important elements of SMS was the sharing of knowledge. He recognized that resistance to reporting was a reality, but suggested that voluntary reporting should be encouraged.

### 3.7 **Agenda Item 5: Lithium batteries in the post**

#### 3.7.1 **Proposed Amendment to the Technical Instructions and the Supplement to Allow Lithium Batteries Contained in Equipment in the Post (DGP-WG/LB/1-WP/12)**

3.7.1.1 The DGP-WG/LB was asked to revisit the proposal presented at DGP/23 by the Universal Postal Union (UPU) to permit equipment containing no more than four lithium cells or two lithium batteries in the international post (see paragraph 5.1.6 of DGP/23-WP/102). DGP/23 had several concerns with allowing lithium batteries in airmail which were raised with the UPU at that meeting.

3.7.1.2 An ad hoc DGP/UPU working group was set up following DGP/23 to work on addressing the concerns raised. A portal was set up on the ICAO secure site as a communication tool for the group (<https://portal.icao.int/ICAOU/UPU/Pages/default.aspx>). UPU documented what had been done by the postal community both at international and national levels to mitigate the risk of the unauthorized introduction of dangerous goods in the mail stream and steps they had taken to revise existing procedures

and devise new procedures which would address the issues raised by the DGP. The DGP members of the ad hoc working group were encouraged by the work, but expressed concerns with the actual implementation of these procedures. The DGP members also expressed concerns over a lack of distinction between measures taken to address security threats versus measures taken to address safety threats. UPU explained that in supply chain operations, both safety and security should go hand in hand.

3.7.1.3 It was recognized by the ad hoc working group that closer coordination between civil aviation authorities (CAAs) and national postal authorities was needed and would be critical if lithium batteries contained in equipment were to be introduced into the mail safely. As such, a new proposal was developed by the ad hoc group which would require that procedures for controlling the introduction of dangerous goods in mail into air transport by designated postal operators be subject to the review and approval of civil aviation authorities. The proposal would also require that postal authorities establish training programmes in accordance with Part 1;4 which would also be subject to the review and approval of civil aviation authorities.

3.7.1.4 Several amendments to the Technical Instructions were proposed, and guidance material was developed for inclusion in the Supplement. These included:

- a) A new exception was added to the Instructions which would permit lithium batteries contained in equipment in the post (Part 1;3.2.2) along with provisions to require the civil aviation authority to review and approve the postal authority's procedures before the exception could be applied (1;2.3.3 and 1;2.3.4). Guidance to States for assessing designated postal operators' procedures was developed for the Supplement (Part S-1;3). The material was based on issues raised at DGP/23 and by the ad hoc DGP/UPU working group.
- b) A definition for "designated postal operators" was developed in consultation with UPU for Part 1;3 of the Technical Instructions.
- c) Training requirements for designated postal authorities were added to Part 1;4. It was originally proposed to incorporate designated postal operators into Table 1-4 of the Instructions either in the same columns which applied to freight forwarders or as a new column. It was suggested, however, that the content of training courses which would be required of postal workers was unique and would be better suited in a new table. As such, Table 1-6 was developed, and three categories of staff of designated postal operators were incorporated into it: those involved in accepting mail containing dangerous goods, those involved in processing mail (other than dangerous goods) and those involved in the handling, storage and loading of mail. Some felt that these training requirements were excessive, but it was stressed that training would be commensurate with responsibilities, and it was felt that postal workers should be familiar with the same training content as freight forwarders. Guidance on the level of training which would be required was developed for States and included in the Supplement (Part S-1;3). It was noted that a decision had been made at an earlier DGP meeting to require that all dangerous goods training courses include provisions for passengers and crew regardless of whether or not this was commensurate with responsibilities. The decision was made on the basis that most employees would be passengers at some point in time; training could therefore be used as a tool for outreach. Finally, it was suggested that a competency framework be developed for designated postal operators and provided with the competency frameworks developed for State employees, shippers and freight forwarders at DGP/23. It was agreed that

the working group on training would develop the framework over the course of the next biennium.

3.7.1.5 The proposal from the UPU included an exception for lithium batteries contained in equipment but not to lithium batteries packed with equipment. It was questioned whether the omission of lithium batteries packed with equipment from the exceptions was intentional, noting that many consumer products, such as cellular phones, were shipped this way. The UPU confirmed that the intent was to permit only those contained in equipment, noting this was in line with the recent amendment to the UPU Convention.

3.7.1.6 Some members felt the proposal was premature and could not support it for adoption in the 2013-2014 Edition. It was noted that the original proposal had been significantly modified since DGP/23 and was only available to panel members on the first day of the working group meeting. These members felt it necessary to consult with experts within their States before taking a decision on it. The group was reminded that communication between the DGP and UPU members of the joint DGP/UPU working group was undertaken on the ICAO/UPU website which all members were invited to join. It was noted, however, that a major contribution from the UPU was submitted only days before the start of DGP-WG/LB. The new proposal was developed based on this material.

3.7.2 The majority of members supported the intent of the new proposal on the basis that CAA approval would provide a mechanism to ensure that the issues raised at DGP/23 were addressed before postal authorities permitted the dangerous goods in the mail. Many felt the new provisions would have a positive impact on safety, as postal workers would now be subject to the training requirements in the Instructions. Members also welcomed the chance to build stronger relationships between civil aviation and postal authorities which would inevitably occur through coordinating efforts to implement these provisions. It was felt that these relationships would facilitate efforts to prevent dangerous goods which were forbidden in the post from being transported by air and ensuring that those dangerous goods which were permitted in the mail were transported safely.

3.7.3 There were several concerns with some of the provisions in the proposal. Some felt that the requirement for civil aviation authority approval was excessive in that approval was not mandatory for shippers or freight forwarders — it was only mandatory for operators. Others felt that CAA approval was appropriate in that postal authorities would be accepting dangerous goods, and the operator would not be able to perform an acceptance check on those goods once they were contained in mail bags. It was also suggested that approval would be mandatory for freight forwarders and shippers were it feasible, but the sheer number of freight forwarders and shippers which existed made it infeasible for States to review and approve them all. Shippers and freight forwarders were, however, subject to State oversight. It was noted that the requirement for States to establish inspection, surveillance and enforcement procedures for all entities performing dangerous goods functions would be strengthened through the proposed amendment to Annex 18 agreed at DGP/23, and that designated postal operators would therefore be included.

3.7.3.1 Some members queried whether the UPU had a mechanism in place to ensure that lithium batteries contained in equipment were not sent to States or through operators which did not permit any dangerous goods in the mail by way of State and operation variations. Such a mechanism would need to account for States where the mail was only in transit and/or airlines which might be involved in interlining. The UPU reported that the same mechanism which was used to ensure items the Instructions currently accepted in the mail were not sent to such States or through such operators would be used for lithium batteries. Panel members suggested that the new provisions could lead more States and/or operators to file variations against exceptions for dangerous goods in the mail. The UPU would need to have processes in place to ensure these changes and any future changes to the Instructions were taken into account.

3.7.3.2 It was noted that the process of reviewing and approving procedures and training programmes would be different in each State. In some States, relationships between civil aviation and postal authorities were already quite strong, and procedures for safely accepting equipment containing dangerous goods would be quite mature. These States could potentially begin introducing lithium batteries contained in equipment in the very near future, while for other States it could take years. Some members felt there would be logistical difficulties in determining what States a package could be transported to or through. Others felt that once a package was accepted by a postal authority in a State which permitted the goods in the mail, it did not matter what State it was being sent to unless that State had a variation forbidding dangerous goods in the post. The UPU reported that a list of States which had procedures and training approved would be maintained and made publically available. The Secretary noted that efforts to further strengthen the relationship between ICAO and UPU were underway in the form of a memorandum of understanding. On that basis, the list could be developed and maintained jointly and made available on both the ICAO and UPU websites.

3.7.3.3 A revised amendment was agreed by the working group. The meeting did not agree to a request by the UPU to adopt the new provisions through an addendum to the current edition of the Technical Instructions. Some members had no difficulty supporting the UPU's request, on the basis that lithium batteries contained in equipment would continue to be forbidden in airmail until approval from CAAs was granted. In some States, procedures for safely accepting equipment containing dangerous goods would be quite mature; it was felt that these States should be provided the option of adopting the provisions before 2013. Other members noted that, in accordance with Council and ANC policy, addenda and corrigenda to the Instructions were only published when safety concerns or, in some cases, facilitation issues needed to be addressed. It was also felt that an addendum would be premature in that States needed time to familiarize themselves with the new provisions and time to consider whether or not any variations to the new provisions were necessary.. Frameworks were not yet in place for reviewing and approving procedures, and criteria for evaluating training programmes would need to be developed.

3.7.3.4 It was agreed that the provisions should be incorporated in the 2013-2014 Edition of the Technical Instructions.

### **3.8 Agenda Item 6: Other business**

#### **3.8.1 Lithium Batteries and Approvals Required for Transport (DGP-WG/LB/1-WP/6)**

3.8.1.1 Problems associated with securing approvals from States for transporting large lithium ion batteries were reported. Alternatives to the approval process were suggested, and panel members were asked to provide comments which would be used to base draft amendment proposals on during the next biennium.

#### **3.8.2 Net Quantity Limits For Un 1057 — Lighters (DGP-WG/LB/1-WP/13)**

3.8.2.1 It was suggested that DGP/23 overlooked an amendment in association with the revised definition of "net quantity" (see paragraph 2.2.1.3 of the DGP/23 Report). A proposal was made to amend Part 5;4.1.5.1 to make specific reference to the requirement for the shipper to declare the net quantity of gas as required by Packing Instruction 201 and to allow for verification that the net quantity of gas in each package was within the limits specified in Table 3-1. Some members felt that declaring the net quantity of gas in the lighters would be difficult and that the lighter should be considered an article. Although it was recognized that a conflict existed between Packing Instruction 201 and Part 5;4.1.5.1, members felt that

the issue was not a safety a concern and preferred considering it during the next biennium rather than making a quick decision. The amendment was not agreed.

### **3.8.3 Proposed Amendment to the Passenger Provisions for Small Cartridges Fitted into other Devices to Address an Oversight in the DGP/23 Report (DGP-WG/LB/1-WP/14)**

3.8.3.1 The current passenger provision for self-inflating life jackets containing Division 2.2 gas was expanded to include other articles at DGP/23. It was suggested that an error was introduced in the amendment as presented in the DGP/23 Report whereby the article was listed as “small cartridges *fitted* into other devices”. Although “fitted” was applicable to self-inflating life jackets, it was suggested that it was not intended to apply to the other small cartridges or devices. It was agreed to revise the amendment as presented in the DGP/23 Report.

### **3.8.4 State of Overflight in the exemption process**

3.8.4.1 The President of the ANC, during his address at the opening of the working group meeting, reported that all items in the DGP/23 Report had been considered by the Commission except for Agenda Item 5.1 (Review of provisions for the transport of lithium batteries). Agenda Item 5.1 would be considered by the ANC during its review of the report of this working group meeting. He reported that the ANC supported all recommendations made by DGP/23 for amendment to Annex 18, except Recommendation 1/1 — Amendment to the general applicability requirements in Annex 18. The ANC recognized the need to facilitate the exemption process in relation to State of Overflight, but it raised many of the same issues which were raised at DGP/23 (see paragraph 1.1.5 of the DGP/23 Report). It felt that the issue was beyond the purview of the DGP and the ANC and recommended that an alternate solution be developed with legal assistance. Accordingly, notional text was developed by the ICAO Secretariat as a basis for discussion.

3.8.4.2 A legal officer from the Legal Affairs and External Relations Bureau of ICAO presented the text to the meeting and stressed that it was merely demonstrative and meant to suggest a philosophy which should be considered in developing a Standard. He expressed concern with the text developed at DGP/23 whereby the absence of a response to an application for an exemption meant that an exemption was granted and explained that a more affirmative approach would need to be taken to ensure States’ sovereignty (recognized in Articles 1, 11 and 35 of the Chicago Convention) is respected. For example, an exemption could be automatically granted by the State of Overflight based on a triggering event, which in the sample text was the receipt of notification of exemptions having been granted by the State of Origin, Operator, Transit and Destination. The State could then be given a predefined time period in which to rescind the exemption. He emphasized that if such an approach was determined to be desirable, the actual “triggering event” would have to be determined by the DGP based on operational feasibility.

3.8.4.3 The meeting was encouraged by the intent of the Standard. There remained concerns, however, with the assumption that the entity receiving the notification of an exemption would be the entity responsible for determining whether or not an exemption should be rescinded or even if the notification was received at all. The legal officer understood these concerns and reminded the group that this “triggering event” would need to be established by the DGP based on what was operationally feasible. Once this was done, he remained confident that they could craft a Standard that would be legally sound and would not infringe on States’ sovereignty.

3.8.4.4 Recognizing that the goal of the working group of the whole meeting was to tighten safety measures for lithium batteries, time was limited for discussions on the exemption process. The group was unable to develop text, but panel members agreed to consider the comments provided by the

Legal Bureau once the meeting was over and provide the Secretary with draft proposals through correspondence.

4. **CONCLUSION**

4.1 Amendments related to lithium battery provisions which were agreed by DGP-WG/LB are contained in Appendix A to this report. Amendments related to lithium batters in the post are contained in Appendix B. These amendments will be published in an addendum to the DGP/23 Report.

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APPENDIX A

PROPOSED AMENDMENTS TO THE PROVISIONS RELATED TO LITHIUM BATTERIES IN  
THE TECHNICAL INSTRUCTIONS

Part 3

DANGEROUS GOODS LIST,  
SPECIAL PROVISIONS AND  
LIMITED AND EXCEPTED QUANTITIES

Table 3-1. Dangerous Goods List

Name	UN No.	Class or division	Subsidiary risk	Labels	State variations	Special provisions	UN packing group	Excepted quantity	Passenger aircraft		Cargo aircraft	
									Packing instruction	Max. net quantity per package	Packing instruction	Max. net quantity per package
1	2	3	4	5	6	7	8	9	10	11	12	13
Lithium ion batteries (including lithium ion polymer batteries)	3480	9		Miscellaneous	US 3	A51 A88 A99 A154 A164 A183	II	E0	965 See	5 kg 965	965 See	35 kg 965
Lithium metal batteries (including lithium alloy batteries)	3090	9		Miscellaneous	US 2 US 3	A88 A99 A154 A164 A183	II	E0	968 See	2.5 kg 968	968 See	35 kg 968

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## Part 4

# PACKING INSTRUCTIONS

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*Editorial Note.*— Amendments agreed at DGP-WG/LB/1 are designated with redline/strikeout text. Amendments agreed at DGP/23 have been incorporated in the text without redline/strikeout.

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See paragraph 3.1.1 of this report:

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### Packing Instruction 965

Passenger and cargo aircraft for UN 3480

#### 1. Introduction

This entry applies to lithium ion or lithium polymer batteries. This packing instruction is structured as follows:

- Section IA applies to lithium ion cells with a Watt-hour rating in excess of 20 Wh and lithium ion batteries with a Watt-hour rating in excess of 100 Wh, which must be assigned to Class 9 and are subject to all of the applicable requirements of these Instructions;
- Section IB applies to lithium ion cells with a Watt-hour rating not exceeding 20 Wh and lithium ion batteries with a Watt-hour rating not exceeding 100 Wh packed in quantities that exceed the allowance permitted in Section II, Table 965-II; and
- Section II applies to lithium ion cells with a Watt-hour rating not exceeding 20 Wh and lithium ion batteries with a Watt-hour rating not exceeding 100 Wh packed in quantities not exceeding the allowance permitted in Section II, Table 965-II.

#### 2. Lithium batteries forbidden from transport

The following applies to all lithium ion cells and batteries in this packing instruction:

Cells and 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).

Waste lithium batteries and lithium batteries being shipped for recycling or disposal are forbidden from air transport unless approved by the appropriate national authority of the State of Origin and the State of the Operator.

~~Section I of this packing instruction applies to lithium ion and lithium polymer cells and batteries that are assigned to Class 9. Certain lithium ion and lithium polymer cells and batteries offered for transport and meeting the requirements of Section II of this packing instruction, subject to the paragraphs above, are not subject to other additional requirements of these Instructions.~~

## Packing Instruction 965

Passenger and cargo aircraft for UN 3480

### IA. SECTION IA

Section IA requirements apply to ~~each cell or battery type~~ lithium ion cells with a Watt-hour rating in excess of 20 Wh and lithium ion batteries with a Watt-hour rating in excess of 100 Wh that ~~has~~ have been determined to meet the criteria for assignment to Class 9.

Each cell or battery must:

- 1) be of the type proven to meet the requirements of each test in the UN *Manual of Tests and Criteria*, Part III, sub-section 38.3;

*Note.— Batteries are subject to these tests irrespective of whether the cells of which they are composed have been so tested.*

- 2) incorporate a safety venting device or be designed to preclude a violent rupture under conditions normally incident to transport and be equipped with an effective means of preventing external short circuits; and
- 3) be manufactured under a quality management programme as described in 2;9.3.1 e).

Each battery containing cells or a series of cells connected in parallel must be equipped with an effective means, as necessary, to prevent dangerous reverse current flow (e.g. diodes, fuses).

#### IA.1 General requirements

Part 4;1 requirements must be met.

**Table 965-IA**

<i>Contents</i> <u>UN number and proper shipping name</u>	<u>Net quantity per package quantity (Section I)</u>	
	<i>Passenger</i>	<i>Cargo</i>
<u>UN 3480</u> <del>Lithium ion cells and batteries</del>	5 kg	35 kg

#### IA.2 Additional packing requirements

- Lithium ion cells and batteries must be protected against short circuits.
- Lithium ion cells and batteries must be placed in inner packagings that completely enclose the cell or battery then placed in an outer packaging. The completed package for the cells or batteries must meet the Packing Group II performance requirements.
- 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 strong outer packagings, in 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.
- Batteries manufactured after 31 December 2011 must be marked with the Watt-hour rating on the outside case.

#### IA.3 Outer packagings

##### *Boxes*

Aluminium (4B)  
Fibreboard (4G)  
Natural wood (4C1, 4C2)  
Other metal (4N)  
Plastics (4H2)  
Plywood (4D)  
Reconstituted wood (4F)  
Steel (4A)

##### *Drums*

Aluminium (1B2)  
Fibre (1G)  
Other metal (1N1)  
Plastics (1H2)  
Plywood (1D)  
Steel (1A2)

##### *Jerricans*

Aluminium (3B2)  
Plastics (3H2)  
Steel (3A2)

**Packing Instruction 965**  
Passenger and cargo aircraft for UN 3480

**IB. SECTION IB**

Section IB requirements apply to lithium ion cells with a Watt-hour rating not exceeding 20 Wh and lithium ion batteries with a Watt-hour rating not exceeding 100 Wh packed in quantities that exceed the allowance permitted in Section II, Table 965-II.

Quantities of lithium ion cells or batteries that exceed the allowance permitted in Section II, Table 965-II must be assigned to Class 9 and are subject to all of the applicable provisions of these Instructions (including the requirements in paragraph 2 of this packing instruction and of this section) except for the following:

- the provisions of Part 6; and
- the dangerous goods transport document requirements of 5.4, provided alternative written documentation is provided by the shipper describing the contents of the consignment. Where an agreement exists with the operator, the shipper may provide the information by electronic data processing (EDP) or electronic data interchange (EDI) techniques. The information required is as follows and should be shown in the following order:

- 1) the name and address of the shipper and consignee;
- 2) UN 3480;
- 3) Lithium ion batteries PI 965 IB;
- 4) the number of packages and the gross mass of each package.

Lithium ion cells and batteries may be offered for transport if they meet all of the following:

- 1) for lithium ion cells, the Watt-hour rating (see the Glossary of Terms in Attachment 2) is not more than 20 Wh;
- 2) for lithium ion batteries, the Watt-hour rating is not more than 100 Wh;
  - the Watt-hour rating must be marked on the outside of the battery case except for those batteries manufactured before 1 January 2009;
- 3) each cell or battery is of the type proven to meet the requirements of each test in the UN *Manual of Tests and Criteria*, Part III, sub-section 38.3. However, batteries and cells manufactured before 1 January 2014 conforming to a design type tested according to the requirements of the fifth revised edition of the UN *Manual of Tests and Criteria*, Part III, sub-section 38.3 may continue to be transported;

*Note.— Batteries are subject to these tests irrespective of whether the cells of which they are composed have been so tested.*

- 4) cells and batteries must be manufactured under a quality management programme as described in 2.9.3.1 e).

**IB.1 General requirements**

Cells and 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).

**Table 965-IB**

<u>Contents</u>	<u>Package quantity</u>	
	<u>Passenger</u>	<u>Cargo</u>
<u>Lithium ion cells and batteries</u>	<u>10 kg G</u>	<u>10 kg G</u>

## Packing Instruction 965

Passenger and cargo aircraft for UN 3480

### IB.2 Additional requirements

- Cells and batteries must be packed in inner packagings that completely enclose the cell or battery then placed in a strong outer packaging.
- Cells and batteries must be protected so as to prevent short circuits. This includes protection against contact with conductive materials within the same packaging that could lead to a short circuit.
- Each package must be capable of withstanding a 1.2 m drop test in any orientation without:
  - damage to cells or batteries contained therein;
  - shifting of the contents so as to allow battery to battery (or cell to cell) contact;
  - release of contents.
- Each package must be labelled with a lithium battery handling label (Figure 5-31) in addition to the Class 9 hazard label.
- Each consignment must be accompanied with a document with an indication that:
  - the package contains lithium ion cells or batteries;
  - the package must be handled with care and that a flammability hazard exists if the package is damaged;
  - special procedures must be followed in the event the package is damaged, to include inspection and repacking if necessary; and
  - a telephone number for additional information.

### IB.3 Outer packagings

Boxes

Drums

Jerricans

Strong outer packagings

## II. SECTION II

With the exception of Part 1;2.3 (Transport of dangerous goods by post), 7;4.4 (Reporting of dangerous goods accidents and incidents) and 8;1.1 (Provisions for dangerous goods carried by passengers or crew), lithium ion cells and batteries offered for transport are not subject to other additional requirements of these Instructions if they meet the requirements in paragraph 2 of this packing instruction and of this section.

~~Cells and 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).~~

~~Waste lithium batteries and lithium batteries being shipped for recycling or disposal are forbidden from air transport unless approved by the appropriate national authority of the State of Origin and the State of the Operator.~~

Lithium ion cells and batteries may be offered for transport if they meet all of the following:

- 1) for lithium ion cells, the Watt-hour rating (see the Glossary of Terms in Attachment 2) is not more than 20 Wh;
- 2) for lithium ion batteries, the Watt-hour rating is not more than 100 Wh;
  - the Watt-hour rating must be marked on the outside of the battery case except for those batteries manufactured before 1 January 2009;
- 3) each cell or battery is of the type proven to meet the requirements of each test in the UN *Manual of Tests and Criteria*, Part III, sub-section 38.3. However, batteries and cells manufactured before 1 January 2014 conforming to a design type tested according to the requirements of the fifth revised edition of the UN *Manual of Tests and Criteria*, Part III, sub-section 38.3 may continue to be transported;

*Note.— Batteries are subject to these tests irrespective of whether the cells of which they are composed have been so tested.*

- 4) cells and batteries must be manufactured under a quality management programme as described in 2;9.3.1 e).

## Packing Instruction 965

Passenger and cargo aircraft for UN 3480

### II.1 General requirements

Cells and 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).

Contents	Package quantity (Section II)	
	Passenger	Cargo
Lithium ion cells and batteries	10 kg-G	40 kg-G

**Table 965-II**

<u>Contents</u>	<u>Lithium ion cells and/or batteries with a Watt-hour rating not more than 2.7 Wh</u>	<u>Lithium ion cells with a Watt-hour rating more than 2.7 Wh, but not more than 20 Wh</u>	<u>Lithium ion batteries with a Watt-hour rating more than 2.7 Wh, but not more than 100 Wh</u>
<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>
<u>Maximum number of cells / batteries per package</u>	<u>No limit</u>	<u>8 cells</u>	<u>2 batteries</u>
<u>Maximum net quantity (mass) per package</u>	<u>2.5 kg</u>	<u>n/a</u>	<u>n/a</u>

The limits specified in columns 2, 3 and 4 of Table 965-II must not be combined in the same package.

### II.2 Additional packing requirements

- Cells and batteries must be packed in inner packagings that completely enclose the cell or battery then placed in a strong outer packaging.
- Cells and batteries must be protected so as to prevent short circuits. This includes protection against contact with conductive materials within the same packaging that could lead to a short circuit.
- Each package must be capable of withstanding a 1.2 m drop test in any orientation without:
  - damage to cells or batteries contained therein;
  - shifting of the contents so as to allow battery to battery (or cell to cell) contact;
  - release of contents.
- Each package must be labelled with a lithium battery handling label (Figure 5-31).
- Each consignment must be accompanied with a document with an indication that:
  - the package contains lithium ion cells or batteries;
  - the package must be handled with care and that a flammability hazard exists if the package is damaged;
  - special procedures must be followed in the event the package is damaged, to include inspection and repacking if necessary;
  - a telephone number for additional information; and
  - the words "lithium ion batteries", "in compliance with Section II of PI965" must be placed on the air waybill, when an air waybill is used.
- Any person preparing or offering cells or batteries for transport must receive adequate instruction on these requirements commensurate with their responsibilities.

### II.3 Outer packagings

Boxes

Drums

Jerricans

Strong outer packagings

### II.4 Overpacks

When packages are placed in an overpack, the lithium battery handling label required by this packing instruction must either be clearly visible or the label must be affixed on the outside of the overpack and the overpack must be marked with the word "Overpack".

## Packing Instruction 966

Passenger and cargo aircraft for UN 3481 (packed with equipment) only

### 1. Introduction

This entry applies to lithium ion or lithium polymer batteries packed with equipment.

Section I of this packing instruction applies to lithium ion and lithium polymer cells and batteries that are assigned to Class 9. Certain lithium ion and lithium polymer cells and batteries offered for transport and meeting the requirements of Section II of this packing instruction, subject to paragraph 2 below, are not subject to other additional requirements of these Instructions.

### 2. Lithium batteries forbidden from transport

The following applies to all lithium ion cells and batteries in this packing instruction:

Cells and 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).

~~Section I of this packing instruction applies to lithium ion and lithium polymer cells and batteries that are assigned to Class 9. Certain lithium ion and lithium polymer cells and batteries offered for transport and meeting the requirements of Section II of this packing instruction, subject to the paragraph above, are not subject to other additional requirements of these Instructions.~~

### I. SECTION I

Section I requirements apply to each cell or battery type that has been determined to meet the criteria for assignment to Class 9.

Each cell or battery must:

- 1) be of the type proven to meet the requirements of each test in the UN *Manual of Tests and Criteria*, Part III, sub-section 38.3;

*Note.— Batteries are subject to these tests irrespective of whether the cells of which they are composed have been so tested.*

- 2) incorporate a safety venting device or be designed to preclude a violent rupture under conditions normally incident to transport and be equipped with an effective means of preventing external short circuits; and
- 3) be manufactured under a quality management programme as described in 2;9.3.1 e).

Each battery containing cells or a series of cells connected in parallel must be equipped with an effective means, as necessary, to prevent dangerous reverse current flow (e.g. diodes, fuses).

#### I.1 General requirements

Part 4;1 requirements must be met.

<i>UN Number and Name</i>	<i>Package quantity (Section I)</i>	
	<i>Passenger</i>	<i>Cargo</i>
<b>UN 3481 Lithium ion batteries packed with equipment</b>	5 kg of lithium ion cells or batteries	35 kg of lithium ion cells or batteries

## Packing Instruction 966

Passenger and cargo aircraft for UN 3481 (packed with equipment) only

### I.2 Additional packing requirements

- Lithium ion cells and batteries must be protected against short circuits.
- Lithium ion cells or batteries must:
  - be placed in inner packagings that completely enclose the cell or battery then placed in an outer packaging. The completed package for the cells or batteries must meet the Packing Group II performance requirements; or
  - be placed in inner packagings that completely enclose the cell or battery, then placed with equipment in a package that meets the Packing Group II performance requirements.
- The equipment must be secured against movement within the outer packaging and must be equipped with an effective means of preventing accidental activation.
- For the purpose of this packing instruction, “equipment” means apparatus requiring the lithium ion batteries with which it is packed for its operation.
- Batteries manufactured after 31 December 2011 must be marked with the Watt-hour rating on the outside case.

### I.3 Outer packagings

Boxes	Drums	Jerricans
Aluminium (4B)	Aluminium (1B2)	Aluminium (3B2)
Fibreboard (4G)	Fibre (1G)	Plastics (3H2)
Natural wood (4C1, 4C2)	Plastics (1H2)	Steel (3A2)
Plastics (4H2)	Plywood (1D)	
Plywood (4D)	Steel (1A2)	
Reconstituted wood (4F)		
Steel (4A)		

## II. SECTION II

With the exception of Part 1;2.3 (Transport of dangerous goods by post), 7;4.4 (Reporting of dangerous goods accidents and incidents) and 8;1.1 (Provisions for dangerous goods carried by passengers or crew), lithium ion cells and batteries packed with equipment offered for transport are not subject to other additional requirements of these Instructions if they meet the requirements [in paragraph 2 of this packing instruction](#) [and](#) of this section.

~~Cells and 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).~~

Lithium ion cells and batteries may be offered for transport if they meet [all of](#) the following:

- 1) for lithium ion cells, the Watt-hour rating (see the Glossary of Terms in Attachment 2) is not more than 20 Wh;
- 2) for lithium ion batteries, the Watt-hour rating is not more than 100 Wh;
  - the Watt-hour rating must be marked on the outside of the battery case except for those batteries manufactured before 1 January 2009;
- 3) each cell or battery is of the type proven to meet the requirements of each test in the UN *Manual of Tests and Criteria*, Part III, sub-section 38.3. However, batteries and cells manufactured before 1 January 2014 conforming to a design type tested according to the requirements of the fifth revised edition of the UN *Manual of Tests and Criteria*, Part III, sub-section 38.3 may continue to be transported;

*Note.— Batteries are subject to these tests irrespective of whether the cells of which they are composed have been so tested.*

- 4) cells and batteries must be manufactured under a quality management programme as described in 2;9.3.1 e).

### II.1 General requirements

[Cells and 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).



**Packing Instruction 966**

Passenger and cargo aircraft for UN 3481 (packed with equipment) only

See paragraph 3.1.1.10 of this report:

<i>Contents</i>	<i>Package quantity (Section II)</i>	
	<i>Passenger</i>	<i>Cargo</i>
<i>Net quantity of lithium ion cells or batteries per package</i>	<i>5 kg</i>	<i>5 kg</i>

See paragraph 3.1.1 of this report:

**II.2 Additional-packing requirements**

- Cells and batteries must be packed in inner packagings that completely enclose the cell or battery.
- Cells and batteries must be protected so as to prevent short circuits. This includes protection against contact with conductive materials within the same packaging that could lead to a short circuit.
- The equipment must be secured against movement within the outer packaging and must be equipped with an effective means of preventing accidental activation.
- The maximum number of batteries in each package must be the minimum number required to power the equipment, plus two spares.
- Lithium ion cells or batteries must:
  - be placed in inner packagings that completely enclose the cell or battery then placed in a strong outer packaging; or
  - be placed in inner packagings that completely enclose the cell or battery, then placed with the equipment in a strong outer packaging.
- Each package of cells or batteries, or the completed package, must be capable of withstanding a 1.2 m drop test in any orientation without:
  - damage to cells or batteries contained therein;
  - shifting of the contents so as to allow battery to battery (or cell to cell) contact;
  - release of contents.
- Each package must be labelled with a lithium battery handling label (Figure 5-31).
- Each consignment must be accompanied with a document with an indication that:
  - the package contains lithium ion cells or batteries;
  - the package must be handled with care and that a flammability hazard exists if the package is damaged;
  - special procedures must be followed in the event the package is damaged, to include inspection and repacking if necessary;
  - a telephone number for additional information; and
  - the words "lithium ion batteries", "in compliance with Section II of PI966" must be placed on the air waybill, when an air waybill is used.
- Any person preparing or offering cells or batteries for transport must receive adequate instruction on these requirements commensurate with their responsibilities.

**II.3 Outer packagings***Boxes**Drums**Jerricans*

Strong outer packagings

**II.4 Overpacks**

When packages are placed in an overpack, the lithium battery handling label required by this packing instruction must either be clearly visible or the label must be affixed on the outside of the overpack and the overpack must be marked with the word "Overpack".

## Packing Instruction 967

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

### 1. Introduction

This entry applies to lithium ion or lithium polymer batteries contained in equipment.

Section I of this packing instruction applies to lithium ion and lithium polymer cells and batteries that are assigned to Class 9. Certain lithium ion and lithium polymer cells and batteries offered for transport and meeting the requirements of Section II of this packing instruction, subject to paragraph 2 below, are not subject to other additional requirements of these Instructions.

### 2. Lithium batteries forbidden from transport

The following applies to all lithium ion cells and batteries in this packing instruction:

Cells and 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).

~~Section I of this packing instruction applies to lithium ion and lithium polymer cells and batteries that are assigned to Class 9. Certain lithium ion and lithium polymer cells and batteries offered for transport and meeting the requirements of Section II of this packing instruction, subject to the paragraph above, are not subject to other additional requirements of these Instructions.~~

### I. SECTION I

Section I requirements apply to each cell or battery type that has been determined to meet the criteria for assignment to Class 9.

Each cell or battery must:

- 1) be of the type proven to meet the requirements of each test in the UN *Manual of Tests and Criteria*, Part III, sub-section 38.3;

*Note.— Batteries are subject to these tests irrespective of whether the cells of which they are composed have been so tested.*

- 2) incorporate a safety venting device or be designed to preclude a violent rupture under conditions normally incident to transport and be equipped with an effective means of preventing external short circuits; and
- 3) be manufactured under a quality management programme as described in 2;9.3.1 e).

Each battery containing cells or a series of cells connected in parallel must be equipped with an effective means, as necessary, to prevent dangerous reverse current flow (e.g. diodes, fuses).

#### 1.1 General requirements

Equipment must be packed in strong outer packagings that conform to Part 4;1.1.1, 1.1.3.1 and 1.1-9.10 (except 1.1-9.10.1).

UN number and name	Package quantity (Section I)	
	Passenger	Cargo
UN 3481 Lithium ion batteries contained in equipment	5 kg of lithium ion cells or batteries	35 kg of lithium ion cells or batteries

#### 1.2 Additional packing 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 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.

**Packing Instruction 967**

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

**I.3 Outer packagings**

Boxes

Drums

Jerricans

Strong outer packagings

**II. SECTION II**

With the exception of Part 1;2.3 (Transport of dangerous goods by post), 7;4.4 (Reporting of dangerous goods accidents and incidents) and 8;1.1 (Provisions for dangerous goods carried by passengers or crew), lithium ion cells and batteries contained in equipment offered for transport are not subject to other additional requirements of these Instructions if they meet the requirements in paragraph 2 of this packing instruction and of this section.

~~Cells and 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).~~

Lithium ion cells and batteries may be offered for transport if they meet all of the following:

- 1) for lithium ion cells ,the Watt-hour rating (see the Glossary of Terms in Attachment 2) is not more than 20 Wh;
- 2) for lithium ion batteries, the Watt-hour rating is not more than 100 Wh;  
— the Watt-hour rating must be marked on the outside of the battery case except for those batteries manufactured before 1 January 2009;
- 3) each cell or battery is of the type proven to meet the requirements of each test in the UN *Manual of Tests and Criteria*, Part III, sub-section 38.3. However, batteries and cells manufactured before 1 January 2014 conforming to a design type tested according to the requirements of the fifth revised edition of the UN *Manual of Tests and Criteria*, Part III, sub-section 38.3 may continue to be transported;

*Note.— Batteries are subject to these tests irrespective of whether the cells of which they are composed have been so tested.*

- 4) cells and batteries must be manufactured under a quality management programme as described in 2;9.3.1 e).

Devices such as radio frequency identification (RFID) tags, watches and temperature loggers, which are not capable of generating a dangerous evolution of heat, may be transported when intentionally active. When active, these devices must meet defined standards for electromagnetic radiation to ensure that the operation of the device does not interfere with aircraft systems.

**II.1 General requirements**

Equipment 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).

See paragraph 3.1.1.10 of this report:

<u>Contents</u>	<u>Package quantity (Section II)</u>	
	<u>Passenger</u>	<u>Cargo</u>
<u>Net quantity of lithium ion cells or batteries per package</u>	<u>5 kg</u>	<u>5 kg</u>

## Packing Instruction 967

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

See paragraph 3.1.1 of this report:

### **II.2 Additional packing requirements**

- The equipment must be secured against movement within the outer packaging and must be equipped with an effective means of preventing accidental activation.
- Cells and batteries must be protected so as to prevent short circuits.
- The equipment must be packed in strong 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.
- Each package containing more than four cells or more than two batteries installed in equipment must be labelled with a lithium battery handling label (Figure 5-31) (except button cell batteries installed in equipment (including circuit boards)).
- Each consignment with packages bearing the lithium battery handling label must be accompanied with a document with an indication that:
  - the package contains lithium ion cells or batteries;
  - the package must be handled with care and that a flammability hazard exists if the package is damaged;
  - special procedures must be followed in the event the package is damaged, to include inspection and repacking if necessary;
  - a telephone number for additional information; and
  - the words "lithium ion batteries", "in compliance with Section II of PI967" must be placed on the air waybill, when an air waybill is used.
- Any person preparing or offering cells or batteries for transport must receive adequate instruction on these requirements commensurate with their responsibilities.

### **II.3 Outer packagings**

*Boxes*

*Drums*

*Jerricans*

Strong outer packagings

### **II.4 Overpacks**

When packages are placed in an overpack, the lithium battery handling label required by this packing instruction must either be clearly visible or the label must be affixed on the outside of the overpack and the overpack must be marked with the word "Overpack".

## Packing Instruction 968

Passenger and cargo aircraft for UN 3090

See paragraph 3.1.1 of this report:

### 1. Introduction

This entry applies to lithium metal or lithium alloy batteries in Class 9 (Section I) and lithium metal or lithium alloy batteries subject to specific requirements of these Instructions (Section II). This packing instruction is structured as follows:

- Section IA applies to lithium metal cells with a lithium metal content in excess of 1 g and lithium metal batteries with a lithium metal content in excess of 2 g, which must be assigned to Class 9 and are subject to all of the applicable requirements of these Instructions;
- Section IB applies to lithium metal cells with a lithium metal content not exceeding 1 g and lithium metal batteries with a lithium metal content not exceeding 2 g packed in quantities that exceed the allowance permitted in Section II, Table 968-II; and
- Section II applies to lithium metal cells with a lithium metal content not exceeding 1 g and lithium metal batteries with a lithium metal content not exceeding 2 g packed in quantities not exceeding the allowance permitted in Section II, Table 968-II.

### 2. Lithium batteries forbidden from transport

The following applies to all lithium metal cells and batteries in this packing instruction:-

Cells and 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).

Waste lithium batteries and lithium batteries being shipped for recycling or disposal are forbidden from air transport unless approved by the appropriate national authority of the State of Origin and the State of the Operator.

~~Section I of this packing instruction applies to lithium metal and lithium alloy cells and batteries that are assigned to Class 9. Certain lithium metal and lithium alloy cells and batteries offered for transport and meeting the requirements of Section II of this packing instruction, subject to the paragraphs above, are not subject to other additional requirements of these Instructions.~~

### IA. SECTION IA

~~Section IA requirements apply to each cell or battery type~~ apply to lithium metal cells with a lithium metal content in excess of 1 g and lithium metal batteries with a lithium metal content in excess of 2 g that have been determined to meet the criteria for assignment to Class 9.

Each cell or battery must:

- 1) be of the type proven to meet the requirements of each test in the UN *Manual of Tests and Criteria*, Part III, sub-section 38.3;

*Note.— Batteries are subject to these tests irrespective of whether the cells of which they are composed have been so tested.*

- 2) incorporate a safety venting device or be designed to preclude a violent rupture under conditions normally incident to transport and be equipped with an effective means of preventing external short circuits; and
- 3) be manufactured under a quality management programme as described in 2.9.3.1 e).

Each battery containing cells or a series of cells connected in parallel must be equipped with an effective means, as necessary, to prevent dangerous reverse current flow (e.g. diodes, fuses).

## Packing Instruction 968

Passenger and cargo aircraft for UN 3090

### IA.1 General requirements

Part 4;1 requirements must be met.

**Table 968-IA**

<i>Contents</i> <u>UN number and proper shipping name</u>	<i>Net quantity per package</i> <i>quantity (Section I)</i>	
	<i>Passenger</i>	<i>Cargo</i>
<b>UN 3090 Lithium metal cells and batteries</b>	2.5 kg	35 kg

### IA.2 Additional packing requirements

- Lithium metal cells and batteries must be protected against short circuits.
- Lithium metal cells and batteries must be placed in inner packagings that completely enclose the cell or battery then placed in an outer packaging. The completed package for the cells or batteries must meet the Packing Group II performance requirements.
- 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 strong outer packagings, in 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.
- For lithium metal cells and batteries prepared for transport on passenger aircraft as Class 9:
  - Cells and batteries offered for transport on passenger aircraft must be packed in intermediate or outer rigid metal packaging.
  - Cells and batteries must be surrounded by cushioning material that is non-combustible and non-conductive, and placed inside an outer packaging.

### IA.3 Outer packagings

<i>Boxes</i>	<i>Drums</i>	<i>Jerricans</i>
Aluminium (4B)	Aluminium (1B2)	Aluminium (3B2)
Fibreboard (4G)	Fibre (1G)	Plastics (3H2)
Natural wood (4C1, 4C2)	Other metal (1N1)	Steel (3A2)
Other metal (4N)	Plastics (1H2)	
Plastics (4H2)	Plywood (1D)	
Plywood (4D)	Steel (1A2)	
Reconstituted wood (4F)		
Steel (4A)		

### IB. SECTION IB

Section IB requirements apply to lithium metal cells with a lithium metal content not exceeding 1 g and lithium metal batteries with a lithium metal content not exceeding 2 g packed in quantities that exceed the allowance permitted in Section II, Table 968-II.

Quantities of lithium metal cells or batteries that exceed the allowance permitted in Section II, Table 968-II must be assigned to Class 9 and are subject to all of the applicable provisions of these Instructions (including the requirements in paragraph 2 of this packing instruction and of this section) except for the following:

- the provisions of Part 6; and
- the dangerous goods transport document requirements of 5.4, provided alternative written documentation is provided by the shipper describing the contents of the consignment. Where an agreement exists with the operator, the shipper may provide the information by electronic data processing (EDP) or electronic data interchange (EDI) techniques. The information required is as follows and should be shown in the following order:

- 1) the name and address of the shipper and consignee;
- 2) UN 3090;
- 3) Lithium metal batteries PI 968 IB;
- 4) the number of packages and the gross mass of each package.

**Packing Instruction 968**

Passenger and cargo aircraft for UN 3090

Lithium metal or lithium alloy cells and batteries may be offered for transport if they meet all of the following:

- 1) for lithium metal cells, the lithium content is not more than 1 g;
- 2) for lithium metal or lithium alloy batteries, the aggregate lithium content is not more than 2 g;
- 3) each cell or battery is of the type proven to meet the requirements of each test in the UN *Manual of Tests and Criteria*, Part III, sub-section 38.3. However, batteries and cells manufactured before 1 January 2014 conforming to a design type tested according to the requirements of the fifth revised edition of the UN *Manual of Tests and Criteria*, Part III, sub-section 38.3 may continue to be transported;

Note.— Batteries are subject to these tests irrespective of whether the cells of which they are composed have been so tested.

- 4) cells and batteries must be manufactured under a quality management programme as described in 2;9.3.1 e).

**IB.1 General requirements**

Cells and 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).

**Table 968-IB**

<u>Contents</u>	<u>Package quantity</u>	
	<u>Passenger</u>	<u>Cargo</u>
<u>Lithium metal cells and batteries</u>	<u>2.5 kg G</u>	<u>2.5 kg G</u>

**IB.2 Additional requirements**

- Cells and batteries must be packed in inner packagings that completely enclose the cell or battery then placed in a strong outer packaging.
- Cells and batteries must be protected so as to prevent short circuits. This includes protection against contact with conductive materials within the same packaging that could lead to a short circuit.
- Each package must be capable of withstanding a 1.2 m drop test in any orientation without:
  - damage to cells or batteries contained therein;
  - shifting of the contents so as to allow battery to battery (or cell to cell) contact;
  - release of contents.
- Each package must be labelled with a lithium battery handling label (Figure 5-31) in addition to the Class 9 hazard label.
- Each consignment must be accompanied with a document with an indication that:
  - the package contains lithium metal cells or batteries;
  - the package must be handled with care and that a flammability hazard exists if the package is damaged;
  - special procedures must be followed in the event the package is damaged, to include inspection and repacking if necessary; and
  - a telephone number for additional information.

**IB.3 Outer packagings**BoxesDrumsJerricansStrong outer packagings

## Packing Instruction 968

Passenger and cargo aircraft for UN 3090

### II. SECTION II

With the exception of Part 1;2.3 (Transport of dangerous goods by post), 7;4.4 (Reporting of dangerous goods accidents and incidents) and 8;1.1 (Provisions for dangerous goods carried by passengers or crew), lithium metal or lithium alloy cells and batteries offered for transport are not subject to other additional requirements of these Instructions if they meet the requirements in paragraph 2 of this packing instruction and of this section.

~~Cells and 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).~~

~~Waste lithium batteries and lithium batteries being shipped for recycling or disposal are forbidden from air transport unless approved by the appropriate national authority of the State of Origin and the State of the Operator.~~

Lithium metal or lithium alloy cells and batteries may be offered for transport if they meet all of the following:

- 1) for a lithium metal cell, the lithium content is not more than 1 g;
- 2) for a lithium metal or lithium alloy battery, the aggregate lithium content is not more than 2 g;
- 3) each cell or battery is of the type proven to meet the requirements of each test in the UN *Manual of Tests and Criteria*, Part III, sub-section 38.3. However, batteries and cells manufactured before 1 January 2014 conforming to a design type tested according to the requirements of the fifth revised edition of the UN *Manual of Tests and Criteria*, Part III, sub-section 38.3 may continue to be transported;

*Note.— Batteries are subject to these tests irrespective of whether the cells of which they are composed have been so tested.*

- 4) cells and batteries must be manufactured under a quality management programme as described in 2;9.3.1 e).

#### II.1 General requirements

Cells and 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).

<i>Contents</i>	<i>Package quantity (Section II)</i>	
	<i>Passenger</i>	<i>Cargo</i>
Lithium metal cells and batteries	2.5 kg G	2.5 kg G

**Table 968-II**

<u><i>Contents</i></u>	<u><i>Lithium metal cells and/or batteries with a lithium content not more than 0.3 g</i></u>	<u><i>Lithium metal cells with a lithium content more than 0.3 g but not more than 1 g</i></u>	<u><i>Lithium metal batteries with a lithium content more than 0.3 g but not more than 2 g</i></u>
<u><i>1</i></u>	<u><i>2</i></u>	<u><i>3</i></u>	<u><i>4</i></u>
<u>Maximum number of cells / batteries per package</u>	<u>No limit</u>	<u>8 cells</u>	<u>2 batteries</u>
<u>Maximum net quantity (mass) per package</u>	<u>2.5 kg</u>	<u>n/a</u>	<u>n/a</u>

The limits specified in columns 2, 3 and 4 of Table 968-II must not be combined in the same package.



## Packing Instruction 968

Passenger and cargo aircraft for UN 3090

### II.2 **Additional packing requirements**

- Cells and batteries must be packed in inner packagings that completely enclose the cell or battery then placed in a strong outer packaging.
- Cells and batteries must be protected so as to prevent short circuits. This includes protection against contact with conductive materials within the same packaging that could lead to a short circuit.
- Each package must be capable of withstanding a 1.2 m drop test in any orientation without:
  - damage to cells or batteries contained therein;
  - shifting of the contents so as to allow battery to battery (or cell to cell) contact;
  - release of contents.
- Each package must be labelled with a lithium battery handling label (Figure 5-31).
- Each consignment must be accompanied with a document with an indication that:
  - the package contains lithium metal cells or batteries;
  - the package must be handled with care and that a flammability hazard exists if the package is damaged;
  - special procedures must be followed in the event the package is damaged, to include inspection and repacking if necessary;
  - a telephone number for additional information; and
  - the words "lithium metal batteries", "in compliance with Section II of PI968" must be placed on the air waybill, when an air waybill is used.
- Any person preparing or offering cells or batteries for transport must receive adequate instruction on these requirements commensurate with their responsibilities.

### II.3 **Outer packagings**

*Boxes*

*Drums*

*Jerricans*

Strong outer packagings

### II.4 **Overpacks**

When packages are placed in an overpack, the lithium battery handling label required by this packing instruction must either be clearly visible or the label must be affixed on the outside of the overpack and the overpack must be marked with the word "Overpack".

## Packing Instruction 969

Passenger and cargo aircraft for UN 3091 (packed with equipment) only

### 1. Introduction

This entry applies to lithium metal or lithium alloy batteries packed with equipment.

Section I of this packing instruction applies to lithium metal and lithium alloy cells and batteries that are assigned to Class 9. Certain lithium metal and lithium alloy cells and batteries offered for transport and meeting the requirements of Section II of this packing instruction, subject to paragraph 2 below, are not subject to other additional requirements of these Instructions.

### 2. Lithium batteries forbidden from transport

The following applies to all lithium metal cells and batteries in this packing instruction:

Cells and 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).

~~Section I of this packing instruction applies to lithium metal and lithium alloy cells and batteries that are assigned to Class 9. Certain lithium metal and lithium alloy cells and batteries offered for transport and meeting the requirements of Section II of this packing instruction, subject to the paragraph above, are not subject to other additional requirements of these Instructions.~~

### I. SECTION I

Section I requirements apply to each cell or battery type that has been determined to meet the criteria for assignment to Class 9.

Each cell or battery must:

- 1) be of the type proven to meet the requirements of each test in the UN *Manual of Tests and Criteria*, Part III, sub-section 38.3; ~~and~~

*Note.— Batteries are subject to these tests irrespective of whether the cells of which they are composed have been so tested.*

- 2) incorporate a safety venting device or be designed to preclude a violent rupture under conditions normally incident to transport and be equipped with an effective means of preventing external short circuits; and
- 3) be manufactured under a quality management programme as described in 2;9.3.1 e).

Each battery containing cells or a series of cells connected in parallel must be equipped with an effective means, as necessary, to prevent dangerous reverse current flow (e.g. diodes, fuses).

### I.1 General requirements

Part 4;1 requirements must be met.

UN number and name	Package quantity (Section I)	
	Passenger	Cargo
UN 3091 <b>Lithium metal batteries packed with equipment</b>	5 kg of lithium metal cells or batteries	35 kg of lithium metal cells or batteries

## Packing Instruction 969

Passenger and cargo aircraft for UN 3091 (packed with equipment) only

### I.2 Additional packing requirements

- Lithium metal cells and batteries must be protected against short circuits.
- Lithium metal cells or batteries must:
  - be placed in inner packagings that completely enclose the cell or battery then placed in an outer packaging. The completed package for the cells or batteries must meet the Packing Group II performance requirements; or
  - be placed in inner packagings that completely enclose the cell or battery, then placed with equipment in a package that meets the Packing Group II performance requirements.
- The equipment must be secured against movement within the outer packaging and must be equipped with an effective means of preventing accidental activation.
- ~~— Each completed package containing lithium cells or batteries must be marked and labelled in accordance with the applicable requirements of 5;1, 5;2 and 5;3.~~
- For the purpose of this packing instruction, “equipment” means apparatus requiring the lithium batteries with which it is packed for its operation.
- For lithium metal cells and batteries prepared for transport on passenger aircraft as Class 9:
  - Cells and batteries offered for transport on passenger aircraft must be packed in intermediate or outer rigid metal packaging surrounded by cushioning material that is non-combustible and non-conductive and placed inside an outer packaging.

### I.3 Outer packagings

<i>Boxes</i>	<i>Drums</i>	<i>Jerricans</i>
Aluminium (4B)	Aluminium (1B2)	Aluminium (3B2)
Fibreboard (4G)	Fibre (1G)	Plastics (3H2)
Natural wood (4C1, 4C2)	Plastics (1H2)	Steel (3A2)
Plastics (4H2)	Plywood (1D)	
Plywood (4D)	Steel (1A2)	
Reconstituted wood (4F)		
Steel (4A)		

## II. SECTION II

With the exception of Part 1;2.3 (Transport of dangerous goods by post), 7;4.4 (Reporting of dangerous goods accidents and incidents) and 8;1.1 (Provisions for dangerous goods carried by passengers or crew), lithium metal cells and batteries packed with equipment offered for transport are not subject to other additional requirements of these Instructions if they meet the requirements [in paragraph 2 of this packing instruction and](#) of this section.

~~Cells and 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).~~

Lithium metal cells and batteries may be offered for transport if they meet [all of](#) the following:

- 1) for a lithium metal cell, the lithium content is not more than 1 g;
- 2) for a lithium metal or lithium alloy battery, the aggregate lithium content is not more than 2 g;
- 3) each cell or battery is of the type proven to meet the requirements of each test in the UN *Manual of Tests and Criteria*, Part III, sub-section 38.3. However, batteries and cells manufactured before 1 January 2014 conforming to a design type tested according to the requirements of the fifth revised edition of the UN *Manual of Tests and Criteria*, Part III, sub-section 38.3 may continue to be transported;

*Note.— Batteries are subject to these tests irrespective of whether the cells of which they are composed have been so tested.*

- 4) cells and batteries must be manufactured under a quality management programme as described in 2;9.3.1 e).

## Packing Instruction 969

Passenger and cargo aircraft for UN 3091 (packed with equipment) only

### II.1 General requirements

Cells and 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).

See paragraph 3.1.1.10 of this report:

<u>Contents</u>	<u>Package quantity (Section II)</u>	
	<u>Passenger</u>	<u>Cargo</u>
<u>Net quantity of lithium metal cells or batteries per package</u>	<u>5 kg</u>	<u>5 kg</u>

See paragraph 3.1.1 of this report:

### II.2 Additional packing requirements

- Cells and batteries must be packed in inner packagings that completely enclose the cell or battery.
- Cells and batteries must be protected so as to prevent short circuits. This includes protection against contact with conductive materials within the same packaging that could lead to a short circuit.
- The equipment must be secured against movement within the outer packaging and must be equipped with an effective means of preventing accidental activation.
- The maximum number of batteries in each package must be the minimum number required to power the equipment, plus two spares.
- Lithium metal cells or batteries must:
  - be placed in inner packagings that completely enclose the cell or battery, then placed in a strong outer packaging; or
  - be placed in inner packagings that completely enclose the cell or battery, then placed with the equipment in a strong outer packaging.
- Each package of cells or batteries, or the completed package, must be capable of withstanding a 1.2 m drop test in any orientation without:
  - damage to cells or batteries contained therein;
  - shifting of the contents so as to allow battery to battery (or cell to cell) contact;
  - release of contents.
- Each package must be labelled with a lithium battery handling label (Figure 5-31).
- Each consignment must be accompanied with a document with an indication that:
  - the package contains lithium metal cells or batteries;
  - the package must be handled with care and that a flammability hazard exists if the package is damaged;
  - special procedures must be followed in the event the package is damaged, to include inspection and repacking if necessary;
  - a telephone number for additional information; and
  - the words “lithium metal batteries”, “in compliance with Section II of PI969” must be placed on the air waybill, when an air waybill is used.
- Any person preparing or offering cells or batteries for transport must receive adequate instruction on these requirements commensurate with their responsibilities.

### II.3 Outer packagings

*Boxes*

*Drums*

*Jerricans*

Strong outer packagings

### II.4 Overpacks

When packages are placed in an overpack, the lithium battery handling label required by this packing instruction must either be clearly visible or the label must be affixed on the outside of the overpack and the overpack must be marked with the word “Overpack”.

## Packing Instruction 970

Passenger and cargo aircraft for UN 3091 (contained in equipment) only

### 1. Introduction

This entry applies to lithium metal or lithium alloy batteries contained in equipment.

Section I of this packing instruction applies to lithium metal and lithium alloy cells and batteries that are assigned to Class 9. Certain lithium metal and lithium alloy cells and batteries offered for transport and meeting the requirements of Section II of this packing instruction, subject to paragraph 2 below, are not subject to other additional requirements of these Instructions.

### 2. Lithium batteries forbidden from transport

The following applies to all lithium metal cells and batteries in this packing instruction:

Cells and 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).

~~Section I of this packing instruction applies to lithium metal and lithium alloy cells and batteries that are assigned to Class 9. Certain lithium metal and lithium alloy cells and batteries offered for transport and meeting the requirements of Section II of this packing instruction, subject to the paragraph above, are not subject to other additional requirements of these Instructions.~~

### I. SECTION I

Section I requirements apply to each cell or battery type that has been determined to meet the criteria for assignment to Class 9.

Each cell or battery must:

- 1) be of the type proven to meet the requirements of each test in the *UN Manual of Tests and Criteria*, Part III, sub-section 38.3;

*Note.— Batteries are subject to these tests irrespective of whether the cells of which they are composed have been so tested.*

- 2) incorporate a safety venting device or be designed to preclude a violent rupture under conditions normally incident to transport and be equipped with an effective means of preventing external short circuits; and
- 3) be manufactured under a quality management programme as described in 2.9.3.1 e).

Each battery containing cells or a series of cells connected in parallel must be equipped with an effective means, as necessary, to prevent dangerous reverse current flow (e.g. diodes, fuses).

### I.1 General requirements

Equipment 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).

<i>UN number and name</i>	<i>Package quantity (Section I)</i>	
	<i>Passenger</i>	<i>Cargo</i>
<b>UN 3091 Lithium metal batteries contained in equipment</b>	5 kg of lithium metal cells or batteries	35 kg of lithium metal cells or batteries

## Packing Instruction 970

Passenger and cargo aircraft for UN 3091 (contained in equipment) only

### I.2 Additional packing requirements

- The equipment must be secured against movement within the outer packaging and must be equipped with an effective means of preventing accidental activation.
- The equipment must be packed in strong 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.
- The quantity of lithium metal contained in any piece of equipment must not exceed 12 g per cell and 500 g per battery.

### I.3 Outer packagings

Boxes

Drums

Jerricans

Strong outer packagings

## II. SECTION II

With the exception of Part 1;2.3 (Transport of dangerous goods by post), 7;4.4 (Reporting of dangerous goods accidents and incidents) and 8;1.1 (Provisions for dangerous goods carried by passengers or crew), lithium metal cells and batteries contained in equipment offered for transport are not subject to other additional requirements of these Instructions if they meet the requirements [in paragraph 2 of this packing instruction and](#) of this section.

~~Cells and 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).~~

Lithium metal cells and batteries may be offered for transport if they meet [all of](#) the following:

- 1) for a lithium metal cell, the lithium content is not more than 1 g;
- 2) for a lithium metal or lithium alloy battery, the aggregate lithium content is not more than 2 g.
- 3) each cell or battery is of the type proven to meet the requirements of each test in the UN *Manual of Tests and Criteria*, Part III, sub-section 38.3. However, batteries and cells manufactured before 1 January 2014 conforming to a design type tested according to the requirements of the fifth revised edition of the UN *Manual of Tests and Criteria*, Part III, sub-section 38.3 may continue to be transported;

*Note.— Batteries are subject to these tests irrespective of whether the cells of which they are composed have been so tested.*

- 4) cells and batteries must be manufactured under a quality management programme as described in 2;9.3.1 e).

Devices such as radio frequency identification (RFID) tags, watches and temperature loggers, which are not capable of generating a dangerous evolution of heat, may be transported when intentionally active. When active, these devices must meet defined standards for electromagnetic radiation to ensure that the operation of the device does not interfere with aircraft systems.

### 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).

See paragraph 3.1.1.10 of this report:

<u>Contents</u>	<u>Package quantity (Section II)</u>	
	<u>Passenger</u>	<u>Cargo</u>
<u>Net quantity of lithium metal cells or batteries per package</u>	5 kg	5 kg

## Packing Instruction 970

Passenger and cargo aircraft for UN 3091 (contained in equipment) only

See paragraph 3.1.1 of this report:

### **II.2 Additional packing requirements**

- The equipment must be secured against movement within the outer packaging and must be equipped with an effective means of preventing accidental activation.
- Cells and batteries must be protected so as to prevent short circuits.
- The equipment must be packed in strong 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.
- Each package containing more than four cells or more than two batteries installed in equipment must be labelled with a lithium battery handling label (Figure 5-31) (except button cell batteries installed in equipment (including circuit boards).
- Each consignment with packages bearing the lithium battery handling label must be accompanied with a document with an indication that:
  - the package contains lithium metal cells or batteries;
  - the package must be handled with care and that a flammability hazard exists if the package is damaged;
  - special procedures must be followed in the event the package is damaged, to include inspection and repacking if necessary;
  - a telephone number for additional information; and
- the words "lithium metal batteries", "in compliance with Section II of PI970" must be placed on the air waybill, when an air waybill is used.
- Any person preparing or offering cells or batteries for transport must receive adequate instruction on these requirements commensurate with their responsibilities.

### **II.3 Outer packagings**

*Boxes*

*Drums*

*Jerricans*

Strong outer packagings

### **II.4 Overpacks**

When packages are placed in an overpack, the lithium battery handling label required by this packing instruction must either be clearly visible or the label must be affixed on the outside of the overpack and the overpack must be marked with the word "Overpack".

## Part 5

# SHIPPER'S RESPONSIBILITIES

## Chapter 3

### LABELLING

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#### 3.5.2 Handling labels

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See paragraph 3.1.1.6 b) of this report:

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##### 3.5.2.2 Lithium battery handling label

Packages containing lithium batteries that meet the requirements of Section II of Packing Instructions 965 to 970 must bear a "Lithium battery" handling label shown in Figure 5-31, as required by the applicable packing instruction. The label must be a minimum dimension of 120 mm x 110 mm except labels of 74 mm x 105 mm may be used on packages containing lithium batteries where the packages are of dimensions such that they can only bear smaller labels. The label must show "Lithium metal batteries" or "Lithium ion batteries", as applicable. Where the package contains both types of batteries, the label must show "Lithium metal and lithium ion batteries". Packages containing lithium batteries that meet the requirements of Section IB of Packing Instructions 965 and 968 must bear both a "Lithium battery" handling label shown in Figure 5-31 and a Class 9 hazard label (Figure 5-23).

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## Part 7

# OPERATOR'S RESPONSIBILITIES

#### 4.11 RETENTION OF DOCUMENTS OR INFORMATION

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See paragraph 3.1.1.6 b) of this report:

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4.11.1 The operator must ensure that at least one copy of the documents or information appropriate to the transport by air of a consignment of dangerous goods is retained for a minimum period of three months after the flight on which the dangerous goods were transported. As a minimum, the documents or information which must be retained are the dangerous goods transport documents, the acceptance checklist (when this is in a form which requires physical completion), ~~and~~ the written information to the pilot-in-command and, for shipments offered under Section IB of Packing Instructions 965 and 968, the alternative documentation, if applicable, or information provided on it. These documents or the information must be made available to the appropriate national authority upon request.

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## APPENDIX B

### PROPOSED AMENDMENTS TO THE PROVISIONS IN THE TECHNICAL INSTRUCTIONS RELATED TO LITHIUM BATTERIES IN THE POST

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See paragraph 3.7.1 of this report:

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## Part 1

### GENERAL

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## Chapter 2

### LIMITATION OF DANGEROUS GOODS ON AIRCRAFT

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#### 2.3 TRANSPORT OF DANGEROUS GOODS BY POST

2.3.1 In accordance with the Universal Postal Union (UPU) Convention, dangerous goods as defined in these Instructions, with the exception of those listed below, are not permitted in mail. Appropriate national authorities should ensure that the provisions are complied with in relation to the transport of dangerous goods by air.

2.3.2 The following dangerous goods may be acceptable in mail for air carriage subject to the provisions of the appropriate national authorities concerned and these Instructions which relate to such material:

- a) patient specimens as defined in 2;6.3.1.4 provided that they are classified, packed and marked as required by 2;6.3.2.3.6;
- b) infectious substances assigned to category B (UN 3373) only, when packed in accordance with the requirements of Packing Instruction 650, and solid carbon dioxide (dry ice) when used as a refrigerant for UN 3373; ~~and~~
- c) radioactive material, the activity of which does not exceed one-tenth of that listed in Table 2-15; ~~and~~

~~d) lithium ion batteries contained in equipment (UN 3481) meeting the provisions of Section II of Packing Instruction 967. No more than four cells or two batteries may be mailed in any single package; and~~

~~e) lithium metal batteries contained in equipment (UN 3091) meeting the provisions of Section II of Packing Instruction 970. No more than four cells or two batteries may be mailed in any single package.~~

~~2.3.3 The procedures of designated postal operators for controlling the introduction of dangerous goods in mail into air transport are subject to review and approval by the civil aviation authority of the State where the mail is accepted.~~

~~2.3.4 Before a designated postal operator can introduce the acceptance of lithium batteries as identified in 2.3.2 d) and e) they must have received specific approval from the civil aviation authority.~~

~~Note 1.— Designated postal authorities may accept the dangerous goods identified in 2.3.2 a), b) and c) without receiving specific approval from the civil aviation authority.~~

~~Note 2.— Guidelines for appropriate national authorities and civil aviation authorities are contained in the Supplement to these Instructions (S-1:3).~~

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## Chapter 3

### GENERAL INFORMATION

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#### 3.1 DEFINITIONS

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Designated postal operator. Any governmental or non-governmental entity officially designated by the member State to operate postal services and to fulfill the related obligations arising from the acts of the Universal Postal Union (UPU) Convention on its territory.

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## Chapter 4

### TRAINING

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#### 4.1 ESTABLISHMENT OF TRAINING PROGRAMMES

4.1.1 Initial and recurrent dangerous goods training programmes must be established and maintained by or on behalf of:

- a) shippers of dangerous goods, including packers and persons or organizations undertaking the responsibilities of the shipper;
- b) operators;
- c) ground handling agencies which perform, on behalf of the operator, the act of accepting, handling, loading, unloading, transferring or other processing of cargo, mail or stores;
- d) ground handling agencies located at an airport which perform, on behalf of the operator, the act of processing passengers;
- e) agencies, not located at an airport, which perform, on behalf of the operator, the act of checking in passengers;
- f) freight forwarders; ~~and~~
- g) agencies engaged in the security screening of passengers and their baggage and/or cargo, mail or stores; and
- h) designated postal operators.

4.1.2 Dangerous goods training programmes required by 4.1.1 b) must be subjected to review and approval by the appropriate authority of the State of the Operator. Dangerous goods training programmes required by 4.1.1 h) must be subjected to review and approval by the civil aviation authority of the State where the mail was accepted by the designated postal operator. Dangerous goods training programmes required by other than 4.1.1 b) and h) should be subjected to review and approval as determined by the appropriate national authority.

#### 4.2 TRAINING CURRICULA

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4.2.2 Personnel identified in the categories specified in Table 1-4, ~~or 1-5~~ or 1-6 must be trained or training must be verified prior to the person performing any duty specified in Table 1-4, ~~or 1-5~~ or 1-6.

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4.2.8 Staff of designated postal operators must be trained commensurate with their responsibilities. The subject matter to which their various categories of staff should be familiar with is indicated in Table 1-6.

**Table 1-6. Content of training courses for staff of designated postal operators**

<u>Aspects of transport of dangerous goods by air with which they should be familiar, as a minimum</u>	<u>Designated Postal Operators</u>		
	<u>A</u>	<u>B</u>	<u>C</u>
<u>General philosophy</u>	<u>x</u>	<u>x</u>	<u>x</u>
<u>Limitations</u>	<u>x</u>	<u>x</u>	<u>x</u>
<u>General requirements for shippers</u>	<u>x</u>		
<u>Classification</u>	<u>x</u>		
<u>List of dangerous goods</u>	<u>x</u>		
<u>Packing requirements</u>	<u>x</u>		
<u>Labelling and marking</u>	<u>x</u>	<u>x</u>	<u>x</u>
<u>Dangerous goods transport document and other relevant documentation</u>	<u>x</u>	<u>x</u>	
<u>Acceptance of the dangerous goods listed in 1:2.3.2</u>	<u>x</u>		
<u>Recognition of undeclared dangerous goods</u>	<u>x</u>	<u>x</u>	<u>x</u>
<u>Storage and loading procedures</u>			<u>x</u>
<u>Provisions for passengers and crew</u>	<u>x</u>	<u>x</u>	<u>x</u>
<u>Emergency procedures</u>	<u>x</u>	<u>x</u>	<u>x</u>

**KEY**

- A — Staff of designated postal operators involved in accepting mail containing dangerous goods
- B — Staff of designated postal operators involved in processing mail (other than dangerous goods)
- C — Staff of designated postal operators involved in the handling, storage and loading of mail

Note .— Guidance on the aspects of training to be covered by staff of designated postal operators can be found in S-1:3

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## APPENDIX C

### PROPOSED AMENDMENTS TO THE PROVISIONS IN THE SUPPLEMENT TO THE TECHNICAL INSTRUCTIONS RELATED TO LITHIUM BATTERIES IN THE POST

## Part S-1

## GENERAL

### (ADDITIONAL INFORMATION FOR PART 1 OF THE TECHNICAL INSTRUCTIONS)

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See paragraph 3.7.1.4 of this report:

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### Chapter 3

## GUIDANCE TO STATES ON THE TRANSPORT OF DANGEROUS GOODS BY POST

### 3.1 INTRODUCTION

3.1.1 Annex 18 to the Chicago Convention, *The Safe Transport of Dangerous Goods by Air*, requires States, inter alia, to establish procedures with a view to controlling the introduction of dangerous goods into air transport through its designated postal operators. These procedures must be approved by the civil aviation authority of a State where mail containing dangerous goods is to be accepted by a designated postal operator, prior to the introduction of dangerous goods into air transport through the designated postal operator. The following guidance is offered to assist civil aviation authorities to assess and approve the procedures established by designated postal operators in their State.

3.1.2 Part 1.2.3 of the Technical Instructions outlines those dangerous goods that may be acceptable in mail for carriage by air subject to the provisions of appropriate national authorities, including civil aviation authorities, and the Technical Instructions.

### 3.2 ASSESSMENT OF PROCEDURES

3.2.1 The aim of the assessment is to ensure the suitability of the procedures established by the designated postal operators that control the introduction of dangerous goods into air transport.

3.2.2 The assessment should ensure that designated postal operators have established the following procedures:

- a) training of staff in accordance with Part 1:4 of the Technical Instructions;
- b) reporting of dangerous goods accidents and incidents to civil aviation authorities;
- c) reporting of hidden and undeclared dangerous goods to civil aviation authorities;

- d) provision of information to customers at acceptance points (e.g. street post boxes, post offices, agencies, websites);
- e) provision of information to account customers regarding dangerous goods;
- f) inclusion of clauses in contracts with account customers regarding dangerous goods not permitted in the mail;
- g) emergency procedures;
- h) retention of documents (e.g. dry ice acceptance checklist);
- i) documented acceptance procedures for staff regarding the dangerous goods allowed by Part 1:2.3 of the Technical Instructions.
- j) procedures for requiring the senders name, address and signature on packages containing dangerous goods;
- k) procedures for ensuring that any State or Operator variations in Attachment 3 of the Technical Instructions are complied with;
- l) procedures for ensuring that any changes to the Technical Instructions are incorporated into existing procedures; and
- m) procedures for the handling of packages rejected from transport.

### **3.3 TRAINING**

3.3.1 The staff of a designated postal operator are required to be trained in the requirements commensurate with their responsibilities.

3.3.2 Depending on the responsibilities of the person, the aspects of training to be covered may vary from those shown in Table 1-6 of the Technical Instructions. Therefore, in respect to the acceptance of the dangerous goods permitted by Part 1:2.3.2 of the Technical Instructions, staff of designated postal operators need only be trained in the requirements specific to those items permitted in air mail and not the acceptance of all classes of dangerous goods.

3.3.3 The categories of personnel identified in Table 1-6 of the Technical Instructions are not all encompassing. For example, staff of a designated postal operator who have responsibilities that only involve the handling of letters, correspondence or printed materials that are not capable of containing dangerous goods do not require training.

— END —