International Civil Aviation Organization

DGP/25-WP/24
20/8/15

WORKING PAPER

DANGEROUS GOODS PANEL (DGP)

TWENTY-FIFTH MEETING

Montréal, 19 to 30 October 2015

Agenda Item 5: Development of a comprehensive strategy to mitigate risks associated with the transport of lithium batteries including development of performance-based packaging standards and efforts to facilitate compliance

TRANSPORT OF LITHIUM ION BATTERIES AS CARGO BY AIR

(Presented by M. Rogers)

SUMMARY

This working paper presents a formal proposal to forbid the transport of lithium ion batteries on passenger aircraft.

Action by the DGP: The DGP is invited to consider forbidding the transport of lithium ion batteries on passenger aircraft as presented in the appendix to this working paper.

1. INTRODUCTION

1.1 At the DGP Working Group Meeting in April 2015 (DGP-WG/15, Montréal, 27 April to 1 May 2015), International Coordinating Council of Aerospace Industries Associations (ICCAIA), in cooperation with the International Federation of Air Line Pilots' Associations (IFALPA), presented a working paper addressing the transport of lithium ion batteries on passenger aircraft. One of the recommendations was that high density packages of lithium ion batteries and cells (UN 3480) not be transported as cargo on passenger aircraft until such time as safer methods of transport were established and followed.

1.2 In part because no concise definition of "high density" was presented in April, no further action was taken at that time to address the recommendation to not transport high density shipments of lithium ion batteries. The working group agreed, however, to convene a third international multidisciplinary lithium battery coordination meeting to address the transport provisions for lithium batteries, which was held in Montréal from 28 to 30 July 2015.

1.3 A single definition of high density in terms of numbers of batteries, cells, or packages is not available, due to the various chemistries, packaging configurations, states of charge, and other

variables allowed by the Technical Instructions for the transport of lithium ion batteries. Additionally, the configuration of the cargo compartment in which the batteries are transported, including compartment volume and fire protection features, is not considered. A “high density” shipment is therefore any shipment that may overwhelm the aircraft fire suppression system in the cargo compartment being used if a single cell or battery in the shipment goes into thermal runaway or is ignited by an external fire.

1.4 The propensity to overwhelm an aircraft’s fire suppression system is determined by the energy available in each cell or battery, and the likelihood that a fire in a cell or battery will propagate to other cells or batteries in the shipment. As such, a single large format battery may be considered high density, as may a single package of 5 kg of lithium ion batteries, which may contain as many as 250 individual cells.

1.5 Additionally, no provisions exist within the Technical Instructions to limit placing multiple packages of lithium ion batteries together in a single cargo compartment, whether or not as part of an overpack. This could result in packages that would otherwise not be considered high density forming a high density shipment within a single cargo compartment under the current provisions.

1.6 The preferable method to prevent shipments of lithium ion batteries from potentially overwhelming an aircraft’s fire suppression system is therefore to develop a packaging standard that contains the hazardous effects of a fire to within the package while protecting the package from an external fire, and one which prevents propagation of a fire between packages. Following the latest multidisciplinary meeting in July, it is expected that an independent standard writing group will develop such a standard over the next few years. Until that standard is developed and implemented, shipments of lithium ion batteries (UN 3480) should not be carried aboard passenger aircraft.

2. ACTION BY THE DGP

2.1 The DGP is invited to prohibit shipments of UN 3480 — **Lithium ion batteries** on passenger aircraft, as shown in the appendix to this working paper.

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APPENDIX

PROPOSED AMENDMENT TO PART 3 OF THE TECHNICAL INSTRUCTIONS

Part 3

DANGEROUS GOODS LIST, SPECIAL PROVISIONS AND LIMITED AND EXCEPTED QUANTITIES

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Chapter 2

ARRANGEMENT OF THE DANGEROUS GOODS LIST (TABLE 3-1)

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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 — Lithium batteries	US 3	A88 A99 A154 A164 A183 A206		E0	~~See 965~~ FORBIDDEN		See 965	

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