



DANGEROUS GOODS PANEL (DGP) WORKING GROUP MEETING (DGP-WG/25)

Delhi, India, 21 to 25 April 2025

**Agenda Item 4: Managing safety risks posed by the carriage of energy storage devices (Ref: Job Card
DGP.003.05)**

REPORT OF THE DANGEROUS GOODS PANEL WORKING GROUP ON ENERGY STORAGE DEVICES (DGP-WG/Energy Storage Devices)

(Presented by the Rapporteur of the DGP-WG/Energy Storage Devices)

SUMMARY

This information paper presents a summary of recent activities of the DGP-WG/Energy Storage Devices.

1. INTRODUCTION

1.1 The DGP created the working group on energy storage devices to progress the work identified in ANC job card DGP.003.05 *Mitigating Safety Risks Posed by the Carriage of Lithium Batteries by Air*. The DGP has taken numerous actions to amend the Technical Instructions to strengthen and where possible simplify several of the provisions in the Technical Instructions and create guidance when necessary. The remaining tasks identified on the job card are managed separately by other expert groups. See the appendix to this paper for a copy of the job card.

2. WORK OF DGP-WORING GROUP ON ENERGY STORAGE DEVICES

2.1 The DGP has made significant progress toward completing the items outlined in the job card:

- a) Deleted Section II of Packing Instructions 965 and 968. These exceptions made such consignments less visible to the operator and impacted the ability of operators to conduct a safety risk assessment.
- b) Expanded the existing 30% state of charge restriction for packaged lithium ion batteries to include lithium ion batteries packed with equipment.

- c) Strengthened the packaging requirements for batteries packed with equipment and contained in equipment that are not subject to the UN performance packaging requirements.
- d) Developed guidance material to support States in the granting of approvals to ship lithium ion batteries at higher states of charge.

2.2 The remaining outstanding tasks identified in the job card relate to ongoing work from the SAE G-27 group developing a performance-based packaging standard for lithium batteries and the UN Sub-Committee of Experts on the Transport of Dangerous Goods (SCOE TDG) Working Group on Hazard Based Classification of Lithium Batteries. While both groups have made progress in their respective areas, there is no action for the energy storage devices working group.

3. ACTION BY THE DGP

3.1 The DGP is invited to consider progress of the DGP-WG/Energy Storage Devices to date and discuss areas of focus prior to DGP/30.

DGP-WG/24-IP/5

Appendix

APPENDIX

**ANC JOB CARD DGP.003.05: MITIGATING SAFETY RISKS POSED BY THE CARRIAGE OF
LITHIUM BATTERIES BY AIR**

DGP.003.05	Mitigating safety risks posed by the carriage of lithium batteries by air
Source	DGP/25, Air Navigation Commission (200-13, 201-5 and 6)
Problem Statement	The safety risks posed by uncontained thermal runaway of lithium batteries transported as cargo or carried by passengers on aircraft must be sufficiently mitigated.
Specific Details	<p>Lithium batteries are capable of thermal runaway through cell defect, cell damage (including penetration, surge from outside), heat, rapid discharge or overcharging. The degree of risk is dependent on the battery chemistry, size, manufacturer, packaging, the total energy density of batteries loaded in a cargo compartment, and the cargo compartment configuration. These risks are compounded by the substantial increase in the number of batteries being transported (currently billions per year), increased energy density and upward trends for both. The FAA Office of Security and Hazardous Materials Safety reported 171 air incidents between 20 March 1991 and 15 January 2016 involving batteries and battery-powered devices (the majority of which were lithium) carried as cargo or in baggage involving smoke, fire, extreme heat or explosion. The United Arab Emirates' General Civil Aviation Authority (GCAA) final report on the fatal crash of a UPS cargo plane on 3 September 2010 near Dubai links the accident to lithium batteries and makes recommendations related to lithium batteries. Two other major aircraft accidents where lithium battery cargo shipments were implicated but not proven to be the source of the fire are Asiana Airlines 747 cargo flight near South Korea on 28 July 28 2011 and a UPS DC-8 cargo flight in Philadelphia, PA on 7 February 2006. The United States National Transportation Safety Board NTSB Issued Safety Recommendations About Lithium Batteries as Cargo on Aircraft (A-16-001 and -002) following the publication of the Report on the Asiana Airlines accident on 9 February 2016 and made safety recommendations related to lithium batteries and flammable liquids.</p> <p>The risks are compounded by non-compliance, both deliberate (to avoid extra costs and liability (no declaration signed)) and unintentional (complicated regulations). Deliberate non-compliance needs to be addressed through oversight, including enforcement when necessary. Oversight, however, is often limited for entities beyond CAA's authority, e.g. manufacturers. Consideration needs to be given to increasing the accountability of manufacturers for the safe design and manufacture of cells and batteries and their preparation for shipment". There are also limitations for some CAAs with respect to oversight authority over shippers and freight forwarders. Unintentional non-compliance needs to be addressed through education, outreach, and simplified provisions.</p> <p>The ANC recommended (ANC Min. 201-5 and 6) that the carriage of lithium ion batteries as cargo on passenger aircraft be forbidden until controls are in place which establish an acceptable level of safety. Controls needed include:</p> <ul style="list-style-type: none"> a) Performance-based packaging standards and any additional controls necessary to mitigate safety risks to an acceptable level; and b) Standards and supporting guidance material for operators to conduct safety risk assessments on the carriage of all dangerous goods, including lithium batteries <p>The potential for increased non-compliance if batteries are forbidden for transport on passenger aircraft needs to be addressed.</p> <p>DGP is a supporting expert group for job card FLTOPSP.043.01.</p>
Expected Benefits	Safe transport of lithium batteries by air on both passenger and cargo aircraft.
Reference Documents	<p>AN-WP/8817 (ANC Min 195-4), AN-WP/8860 (ANC Min 196-6), AN-WP/9034 (ANC Min 200-13), AN-WP/9034 (ANC Min 200-13), AN-WP/9021 and Addendum (ANC Min 201-5 and 6), DGP/25 Report, Agenda Item 5</p> <p>FAA battery incident chart: https://www.faa.gov/hazmat/resources/lithium_batteries/media/Battery_incident_chart.pdf</p> <p>National Transportation Safety Board accident report, Inflight Cargo Fire UPS 1307, Philadelphia, Pennsylvania February 7, 2006 www.nts.gov/investigations/AccidentReports/Reports/AAR0707.pdf</p> <p>UAE GCAA final report on of UPS cargo plane on 3 September 2010 near Dubai: http://www.gcaa.gov.ae/en/ePublication/admin/iradmin/Lists/Incidents%20Investigation%20Reports/Attachments/40/2010-2010%20-%20Final%20Report%20-%20Boeing%20747-44AF%20-%20N571UP%20-%20Report%2013%202010.pdf</p> <p>Accident summary and link to Aviation and Railway Accident Investigation Board (ARAIB), Republic of Korea Aircraft Accident Report — Asiana Airlines Boeing 747-400F, HL7604: https://www.skybrary.aero/index.php/B744_en-route_East_China_Sea_2011</p> <p>National Transportation Safety Board Washington, DC 20594 Safety Recommendation http://www.nts.gov/safety/safety-recs/RecLetters/A-16-001-002.pdf</p>

Deliverable Expert Group		Dangerous Goods Panel (DGP)					
ID	Document Affected	Description of Amendment proposal or Action	Supporting Expert Group	Status	Expected Dates		
					Delivery Date	Effective	Applicability
9413	Tech Ins for the ST of DG by Air (Doc 9284)	Additional operational controls to mitigate aviation-specific safety risks posed by lithium batteries including: - Any information defined via job card FLTOSP.043 as necessary to the conduct of safety risk assessments for carriage of cargo including dangerous goods. - A mechanism to ensure transparency of all shipments, including those not subject to full regulation (Section II batteries)	FLTOPSP	Delivered	Q4 2021	Jan 2023	Jan 2023
9414	Tech Ins for the ST of DG by Air (Doc 9284)	Provisions to mitigate safety risks posed by lithium batteries packed with or contained in equipment, including monitoring of exceptions (Section II batteries)	FLTOPSP	Delivered	Q4 2023	Jan 2025	Jan 2025
10573	Supplement to the Tech Instructions (Doc 9284SU)	Guidance material to assist States in considering the granting of approvals to transport lithium ion batteries at higher states of charge	-	On-schedule	Q1 2024	Jan 2025	Jan 2025
9412	Tech Ins for the ST of DG by Air (Doc 9284)	Performance-based packaging standard for lithium batteries	AIRP	Re-scheduled	Q4 2025	Jan 2027	Jan 2027
9416	Tech Ins for the ST of DG by Air (Doc 9284)	Simplified provisions to facilitate full compliance	-	Re-scheduled	Q4 2025	Jan 2027	Jan 2027
9419	Tech Ins for the ST of DG by Air (Doc 9284)	Classification provisions which provide a mechanism to identify and communicate the hazards associated with specific batteries shipped for greater granularity with respect to classification of lithium batteries developed through coordination with the United Nations Economic and Social Council's (ECOSOC) Committee of Experts on the Transport of Dangerous Goods and on the Globally Harmonized System of Classification and Labelling of Chemicals	-	Re-scheduled	Q4 2025	Jan 2027	Jan 2027
10574	Tech Ins for the ST of DG by Air (Doc 9284)	Assess need for additional mitigation measures based on evolving technology and new data	-	On-schedule	Q4 2025	Jan 2027	Jan 2027
Status: Approved		Priority: High	Initial Issue Date: 02 Jun 2016	Date Approved by ANC: 20 Feb 2024	Session / Meeting: 225-3		